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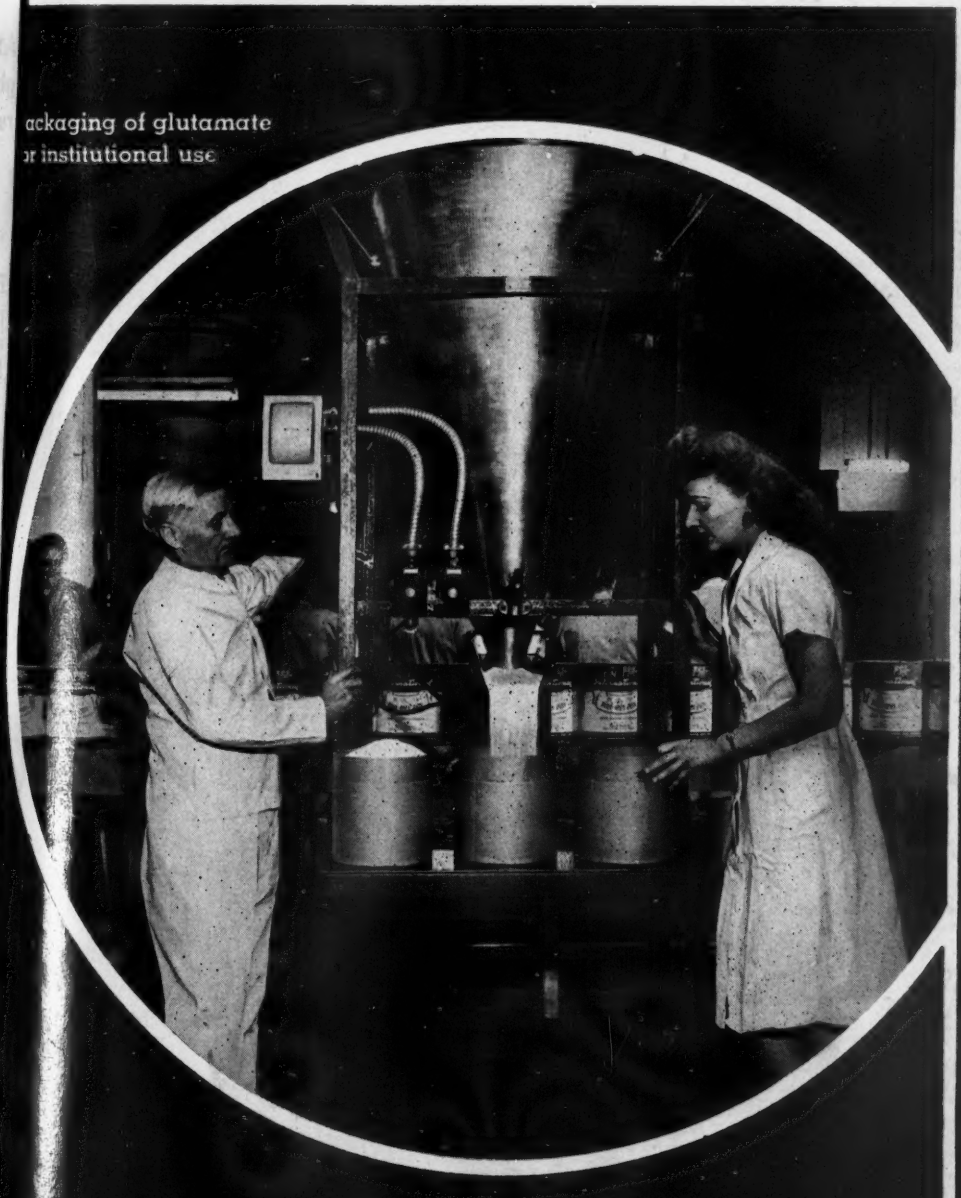
FOOD INDUSTRIES

NATIONAL EDITION

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION



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SEPTEMBER 1947

Comparing Food Freezing Units

Keeping Quality Of Frozen Sausage

New Emulsifying Agents for Foods

Automatic Ice Cream Packaging System

How to Palletize Without Pallets

Sweet Potatoes Used in Candies

Manufacture of Malt Vinegar in Britain

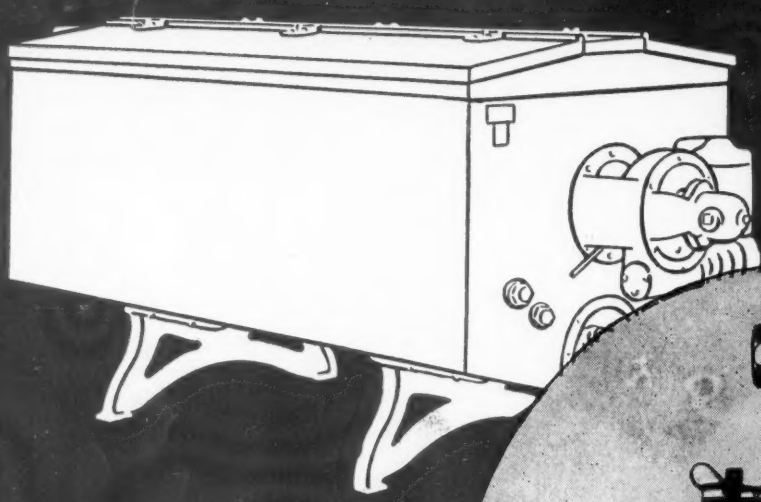
McGRAW-HILL PUBLICATION

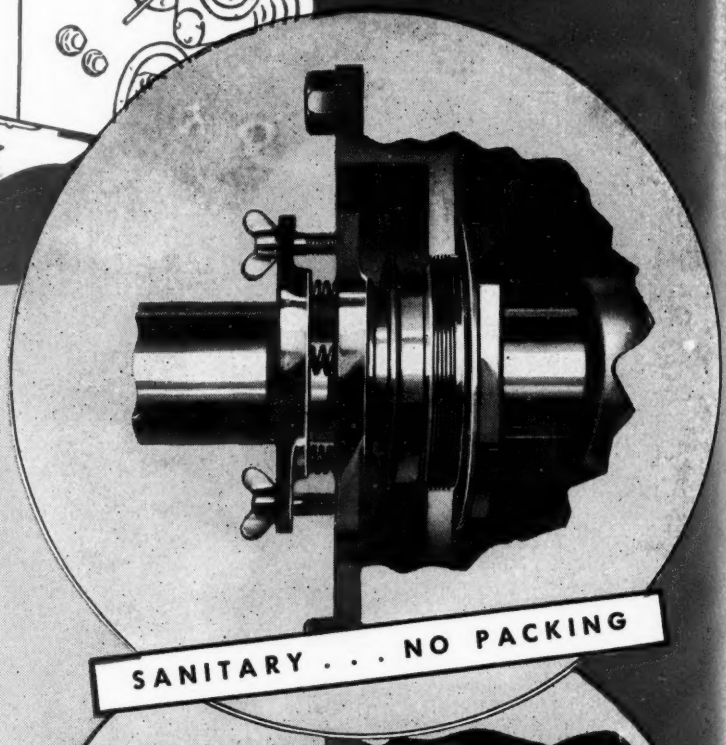
Announcing

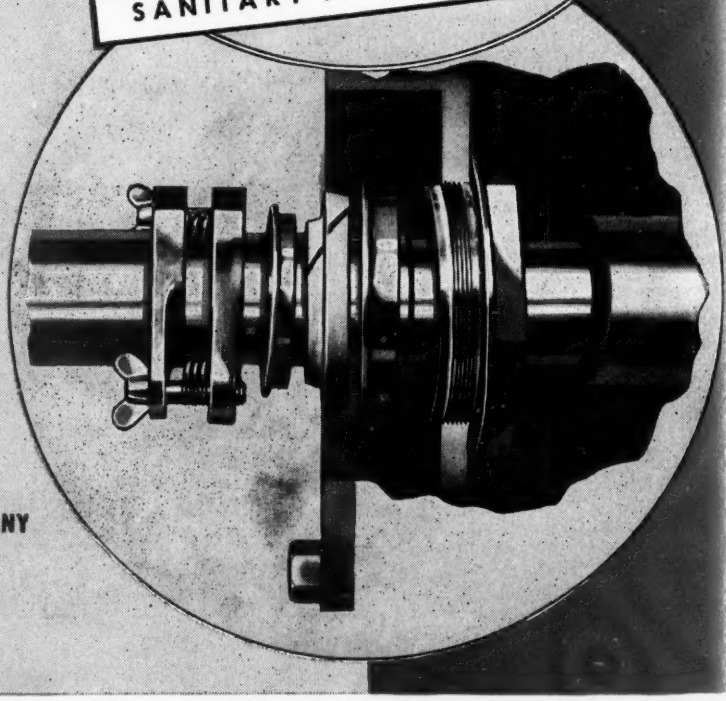
Wizard Coil Pasteurizer

with

SANITARY SEAL







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FOOD INDUSTRIES

FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

SEPTEMBER, 1947 Volume 19, Number 9

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THE COVER

Special packaging line for sodium glutamate is used by International Minerals & Chemicals Corp., Chicago. New product, Chou-Chi Mei-Wei-Fen, food flavor accentuator, is filled in cartons for the restaurant trade on vibra-flow filling machine, with hair-trigger electronic controls.

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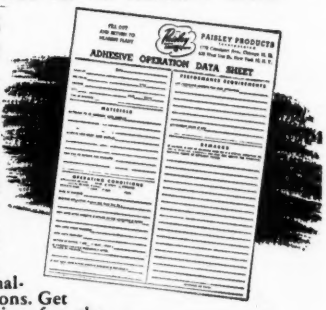

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Values in Corporation Reports

ONLY 758 out of more than 3,500 annual corporation reports have been rated as "modernized" by *Financial World,* an investment publication. While these figures cover all corporations, only 10 well known food company reports have been cited for excellence. The companies are:

California Packing Corporation
Consolidated Grocers Corporation
General Foods Corporation
Gerber Products Company
Hawaiian Pineapple Company
Hunt Foods, Inc.
Libby, McNeill & Libby
Minnesota Valley Canning Co.
A. E. Staley Manufacturing Co.
Stokely-Van Camp, Inc.

Reason for this activity is that investors and banks are continually complaining of the difficulty of obtaining enough information about the affairs of corporations to evaluate their worth for investments or loans.

Out of the thousands of corporations in the food processing industry only 10 have been cited for excellence, and only one of the 10 will receive the annual award. Last year General Foods received the award. Many will wonder why the companies they manage should divulge more data of this sort. It's a fair question that we shall try to answer. For outside of the public relations aspect, which is in line with the times, there are selfish reasons that management should consider.

Valid Reasons for Telling More

Here are a few actual case histories:

1. During the great depression, one food processor needed to borrow millions on a preferred stock issue. Instead of selling the issue at a discount, the stock was quickly sold at a premium—102½, according to our recollection. This was possible because complete information was always available to investors. The head of another successful food company was so astounded by confidential advance news of the forthcoming issue that he intimated the head of the borrowing company must be slightly and unjustifiably "overoptimistic." But the issue sold. In financial lingo, it was not "sticky."

2. In nearly 20 years of experience the editors of FOOD INDUSTRIES have been sought continually for data on specific concerns that want to borrow money from banks or investment houses. Over the years, largely on *our* say-so, several big loans have been decided. One such loan application was for $3,500,000. It does not make sense that a borrower or a lender should be at the mercy of opinion.

3. Not many years ago a certain company was trying to fill a job that would pay well over $20,000 a year, with no takers. While we have no way of knowing to how many the job was offered, it seemed as if all but one of the candidates called on us for information about the company's internal affairs. We had no information beyond the most superficial earnings statements. And that does not make much sense, either.

Many Sources of Information

4. Refusal to divulge information does not prevent those who really want it from learning what they are seeking. Between credit rating agencies, banks, competitors, sources of supply, customers, price lists, ex-employees, and the like, it is possible to learn far more than one on the inside is apt to realize. To illustrate: An investment trust that owned a huge block of stock in a big tobacco company could not get enough satisfactory information out of the company. With over $10,000,000 at stake they put a researcher on the job and after 18 months of painstaking sleuthing he knew as much of the secretive company's affairs as if he had access to all its confidential records.

Inasmuch as information cannot be withheld, short of use of methods of military security, it would seem sensible for all corporations to give out annual reports that really mean something to astute investors.

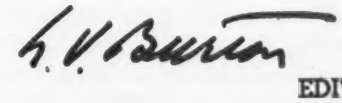
5. Organized labor, as has been often noted, is probably the most avid reader of corporation reports and earnings statements.

Clinton Golden of C.I.O. has said, "Long ago we learned the truth about 'you can't squeeze blood from a turnip.' We don't strike a company unless we know the money is there."

Opportunity to Sell Unions

Knowing this, wouldn't it be smart to write the report in such a way that the union leaders can reach a rational conclusion rather than an unsound one?

With so many valid reasons for issuing informative and comparative corporation reports, it is to be hoped that in another year the food processing companies cited by Financial World will be far more than the 10 so honored in 1947.



EDITOR

The Talk of the Industry

●CONGRESSMEN who had the political courage to support the Taft-Hartley Law and override the President's veto are sore at industrialists who willingly bargain away their new found rights. If industry lacks the guts to use these rights, why all the pressure for law reform?

●BIG query of the past month: Does "Willing and Able" make a contract?

●CONSIDER the plight of Paul Herzog, chairman of National Labor Relations Board. At Congressional hearings on the Taft-Hartley bill he pointed out that it contained many unworkable provisions. Now he has the job of making them work.

●SOME of the cash customers gently take us to task for "bias"—one suspects because we urge commonsense handling of industrial disputes. Others lambaste us for failing to slug hard enough. Which seems to indicate that we are somewhere near the middle of the road. While it is impossible to please everybody, it is the purpose of this magazine to point out the proper course the food processing industry should follow without regard to brickbats or bouquets that may come our way.

●FOR the record: In June, 1947, there were 60,055,000 civilians working on paid jobs which, plus the 1,398,000 in the armed forces, totaled 61,453,000. Unemployment rose 600,000 over May to 2,555,000, which is a decrease of 10,000 from June 1946.

● "FULL EMPLOYMENT," once said James Adams of Standard Brands, "means nothing but having enough customers so that we can employ all who want to work for us."

●WE see by the papers that owners of large blocks of No. 3 quality canned foods are complaining that consumers want only No. 1 and No. 2 quality. Many of them have asked Congress to ship these standards to Europe for relief purposes.

● FARM income for the first half of 1947 was nearly $12,000,000,000, compared with $9,600,000,000 in the corresponding period of 1946. Cash return from livestock and livestock products was about $7,900,000,000. This was an increase of about 40 percent over the same period in 1946. But here is the payoff: Meat animals brought the farmer a 60 percent gain over 1946.

If this keeps up the farmers will all get rich. Time was when the total gross income of the food processing industry was only $9,000,000,000.

● THAT magic word "electronic" seems to get the better of common sense, even when the word is used appropriately. Not long ago a proposal was made that the National Pickle Packers Association spend a few thousand dollars to see if electronic pickle sorting were feasible. Immediately some of the news hawks printed stories that the electronic pickle sorter was here.

Wouldn't it be wonderful if research could be successfully concluded by merely voting a financial appropriation?

● IN spite of all its problems—or rather, because of them—Britain is going to export beer, biscuits, chocolate and jams. This startling intelligence reveals a desperate effort to obtain what are called "hard currencies," for British owned dollars are disappearing rapidly. By sacrificing a small part, about 0.5 percent, of its food supply for the export of luxury foods, Britain hopes to obtain about £10,000,000 of export credits with which to buy additional staple foodstuffs.

●WORLD shortage of wheat in 1946 was 10,000,000 tons. In 1947 the shortage is calculated to be about 20,000,000 tons. In 1946 the U. S. A. exported more than 14,000,000 tons of wheat. This quantity is said to be larger than the entire world's exports of wheat in pre-war days. Let those who say the nation is not living up to its moral obligations integrate that fact with their complaints.

Hors d'Oeuvres

• *The wife of General Marshall tells us that the wife of the senior ranking officer at a tea is always asked to pour coffee, because in the Army "coffee outranks tea." TEN-SHUN.*

• Brewing has been a practiced art since the dawn of human history, according to the U. S. Brewers Foundation. Maybe that's why "pre-brew" periods are always reckoned in millions of years. It must have seemed even longer.

• *Another assist for USDA's classification of fishermen as farmers comes from the director of Fish and Wildlife Service. He tootles for ponds of one to five acres, which, he says, will produce 200 to 300 lb. of edible fish per acre annually, if they are properly fertilized.*

• Pigs aren't supposed to know much about the hereafter, says the Farm Journal, in picturing a pig heaven. Hope they don't find out about the immediate future, either, and why all that feed is being placed before them.

• *Now that canned candies are coming on the commercial market, American Can Co. points out that the provident hostess can lay in a supply that will keep indefinitely. Trouble is, its not so much a matter of keeping as of hiding.*

• USDA is developing custom built breeds of hogs that will produce 10 to 20 percent more ham, bacon and chops, while cutting down on the lard output. But we are too tired of the word "streamlined" to take advantage of this great opportunity.

• *Because sparkling beverages quickly lose their carbonation at high altitudes, Canada Dry says they can't guarantee indefinite liveliness in high flying drinks. What we want is a guarantee of no liveliness at all in the pilot.*

• Britannica Book of the Year says your share of ice cream, last year, was 16 qt. Commerce Department says it was 21. Maybe the Book people discounted the air in the stuff.

• *Way back, the Journal of the American Medical Association said: "Obviously, if beer contains 3.2 percent of alcohol having a calorie value of 7 per gram, and 10 percent of nitrogenous and carbohydrate extractive materials having a calorie value approximating that of sugars, protein and dextrine, i. e., 4 per gram—and assuming that these extractive materials present in beer are utilized in metabolism—a quart of beer will have a value of at least 500 calories." Bet you thought folks drink beer just to quench a thirst.* J.A.J.J.

More Wheat—and More Dust

For at least two years, speculators have been buying up former grazing land, planting it in wheat and reaping surprising profits. Bumper crops have helped ease the grain shortage, but conservationists fear soil erosion will follow

By E. S. STATELER, Associate Editor, "Food Industries," Chicago

WE are now enjoying a fool's paradise in bumper wheat crops—six consecutive ones. These are not a gift from Heaven nor altogether the result of improved agricultural technology, although their production has been aided by mechanization and by better wheat varieties. Neither are these harvests due wholly to unusually favorable weather and soil conditions. Rather, much of this increased production is coming from newly broken ground — grazing land which has been bought up by speculators or planted by cattle men. The cost in lost soil and lost grass-fed cattle may well affect the whole nation, if only through high taxes for erosion control; more specifically by covering over and destroying crops in established farming areas bordering this region.

For as long as two years now speculator buyers have been paying from $15 to $30 an acre for grazing land ordinarily bringing $2 to $10 an acre. Throughout western Nebraska, Kansas and eastern Colorado, these "suitcase farmers" from Texas and from points east of western Kansas and Nebraska have been breaking the sod, planting some row spring crops and then sowing all of the broken ground to wheat in the fall. With the income from bumper wheat crops they pay for the land, pay for the planting, harvesting and hauling, and bank a generous balance.

Take, for example, the case of a man who moved from Ness City, Kansas, to Cheyenne Wells, Colo., two years ago. He bought 480 acres of level land near Cheyenne Wells, at $30 an acre, in May. The wheat was in and showing good promise. Later he hired a combine man to cut the crop and haul it to the elevator. The wheat made 40 bu. an acre, paid for the land and the harvesting and netted the owner $7,000 in the bank.

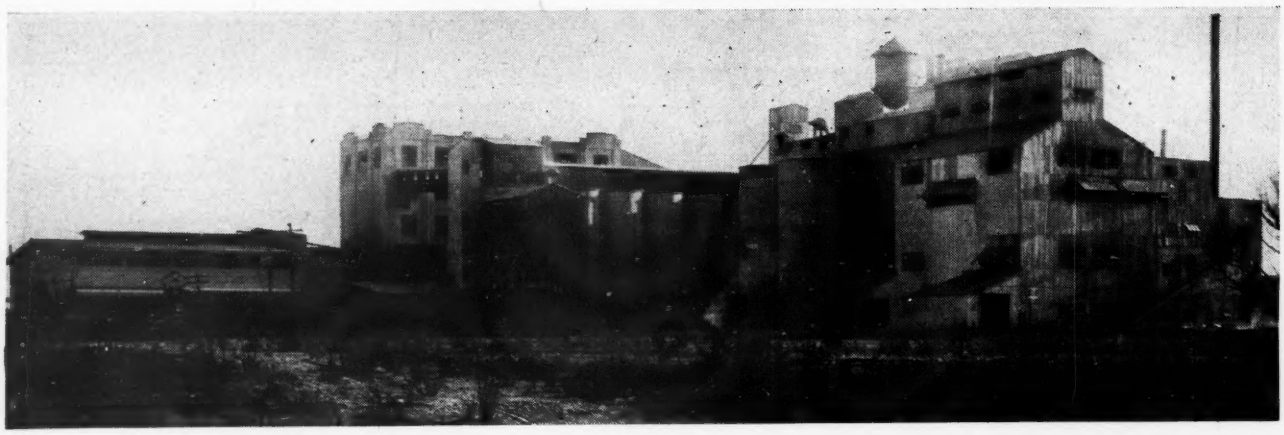
This man is only one of the many who has been encouraged by the high price of wheat to make the gamble. In one county on the western edge of Kansas, 101,048 acres of wheat were threshed in 1918. This year 275,000 acres are in wheat and 300,000 additional acres are expected to be sown for 1948. A 10-

(*Continued on page* 212)

Competent Observers

The author of the article was reared in a former cattle-grazing plains area and saw it become an extensive wheat-growing region, only to become the eastern lip of the vast "dust-bowl" of the early 1930's. He is owner of a farm 250 to 300 miles east of the potential new "dust-bowl" and keeps in touch with changes in the plains states agriculture.

The author's chief informant, George Thiem, farm editor of the Chicago Daily News, has just completed a tour through the region where the "suitcase farmers" are making the most of their opportunities.—The Editors.



MILL of the Rice Growers Association of California at Sacramento, Calif. It has a daily production capacity of 12,000 100-lb. bags, of which approximately one-half are processed to enrich the milled grains with soluble vitamins and minerals from the hull and bran.

Age-Old Process Modernized

Centuries ago in India, rice was steeped, then dried in the sun, after which it was milled. Here is a process incorporating and perfecting those principles in a mechanized, continuous flow operation

By C. R. HAVIGHORST, Associate Editor, "Food Industries," San Francisco, Calif.

ONE of the two processes in use in the U. S. which improve the nutrient value of rice, impart a new flavor and make the grain more resistant to the attack of weevils, is in operation at The Rice Growers Association of Calif. plant at Sacramento. The method used is basically that developed by M. Yonan-Malek, a Persian-American, although some innovations have been added by this company. The Malek process is somewhat similar to the "Converted" Rice process (F. I., June, 1947, p. 79).

The Rice Growers Assn. of California (Sacramento), one of the West's largest grower-owned cooperatives, was established in 1921 and now lists over 400 members. In 1947 this plant will mill over 45 percent of the total California rice crop, approximately 3 million 100-lb. bags. The daily production capacity is 12,000 bags.

This plant uses only one variety of rice—the California Pearl, formerly called Jap rice. Initial tests to determine quality and the price paid to growers involve only moisture content of the grain and the percentage of broken grains and extraneous material found in each lot. Only whole rice is processed. Whole and a varied assortment of broken sizes of rice are milled into white (unprocessed) rice.

Rice Cleaning

Cleaning rice is largely a matter of separating extraneous material from the paddy rice and further separation of broken and hulled grains from the whole rice. Machines used for this purpose are of the sifting type, with aspirators to carry away the lighter material and dust. Dust is aspirated by an air stream from every piece of cleaning and separating equipment in this plant. After initial cleaning, the rice is conveyed to the paddy storage bins.

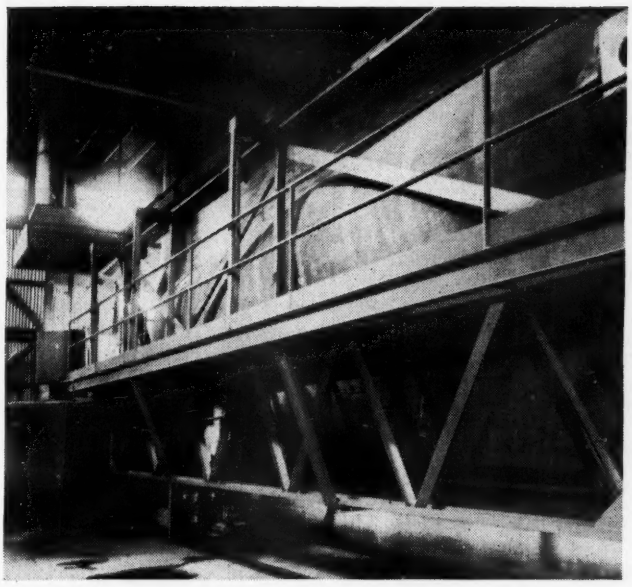
The Process

In order to effect the transfer of water-soluble nutrients from the hull and bran into the grain, the rice is first steeped in hot water and later exposed to heat and steam pressure while being agitated in the rotary steamer. It moves by gravity to decompression chambers where, in 7 minutes, the pressure is gradually reduced so that the grains will not burst under atmospheric pressure. The rice then drops through a spout into a rotary drier and cooler which dries and reduces its temperature to about 140 deg. F. Then it is conveyed to the Berico rice driers. The total time required for the above process is about 30 minutes. Production capacity of processed rice is 250 bags per hour.

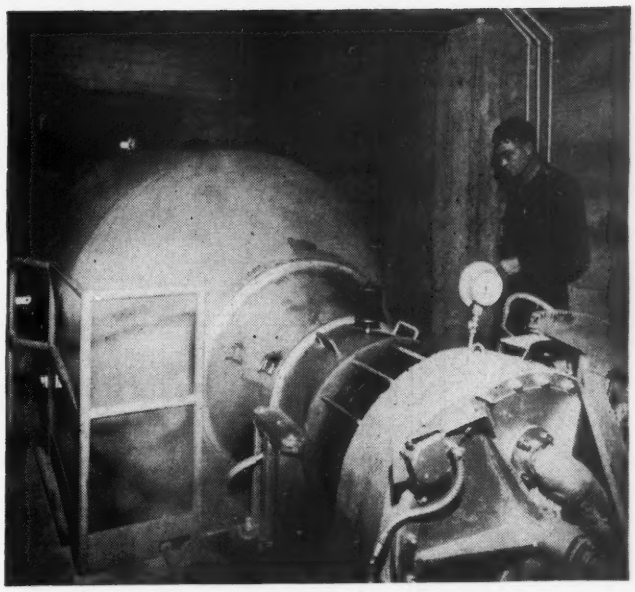
Drying and Cooling

Rice is elevated to a hopper at the top of each of the Berico driers and then flows, by gravity, 40 ft. downwards through two 6-in. wire cloth columns. Hot air under pressure, at temperatures from 100 to 130 deg. F. (according to the moisture content of the rice being dried), enters at the bottom of the driers and, being confined to the area between the two columns and the top of drier, is forced out of the drier through the columns of rice. Moisture tests are made at intervals, as often as 15 min., as the rice flows through these driers. It requires approximately 4½ hr. for the grain to move through driers A, B and C and coolers D and E, (see Flow Diagram). When it leaves the coolers, it contains about 13 percent moisture.

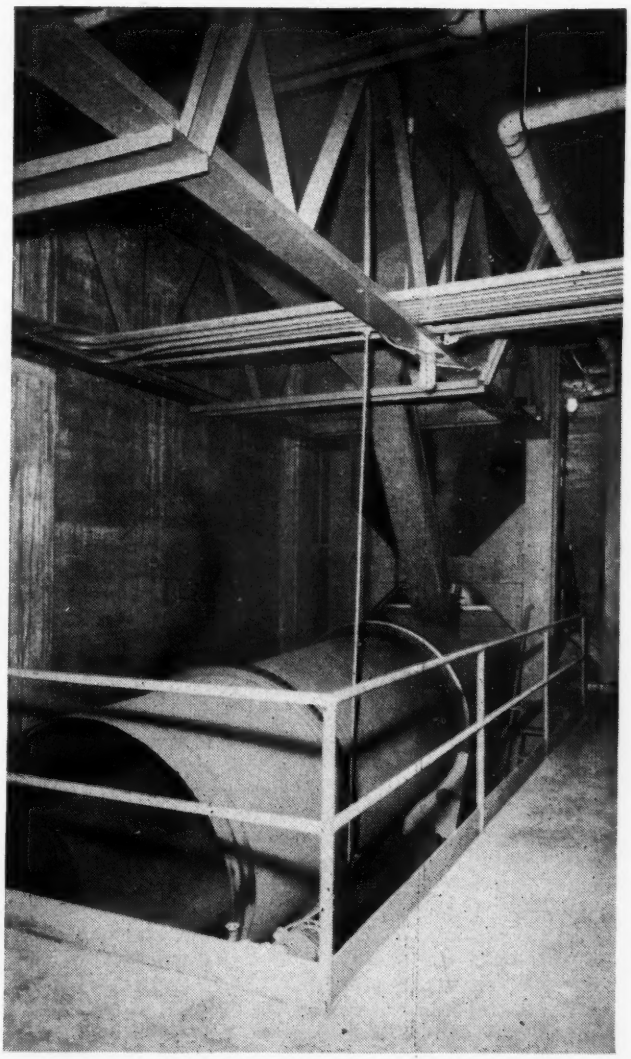
From the driers and coolers, the rice is conveyed to tempering bins



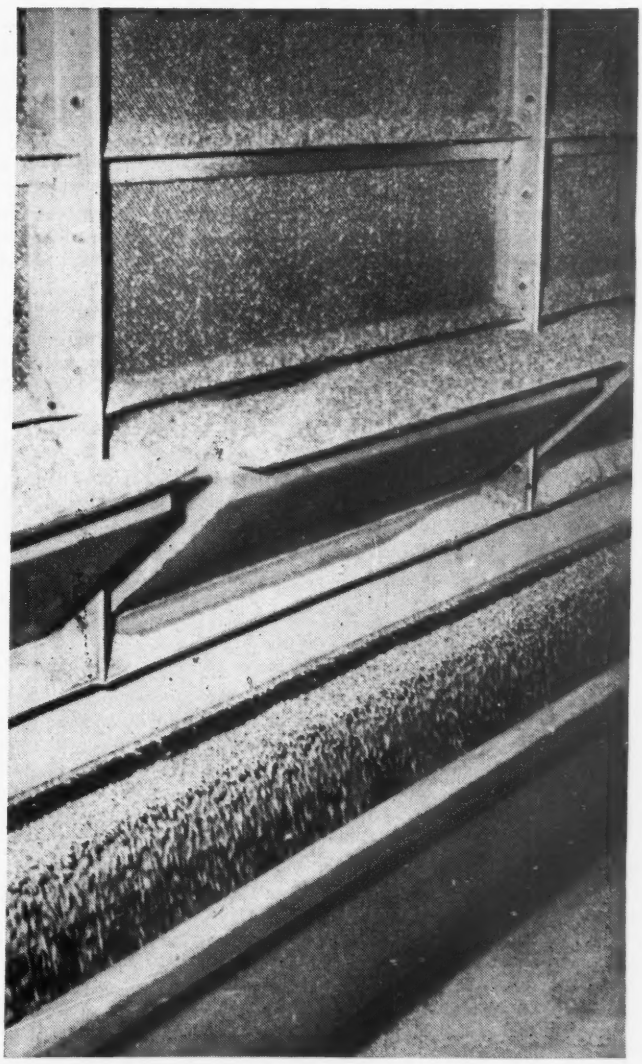
STEEPING in water at 180 deg. F., in either the enclosed screw conveyor (on wooden scaffold at top) or in this large rotary steeper, is the first step in the enrichment process.



DE-WATERING is followed by steaming for 20 min. at 15 psi. in the rotating steamer. Rice then flows into decompression chamber (foreground) where pressure is slowly reduced to atmospheric.



PRELIMINARY DRYING, in this rotary drier, follows discharge of the rice from the decompression chamber. Rice enters through a spout in the rear and discharges to Berico driers.

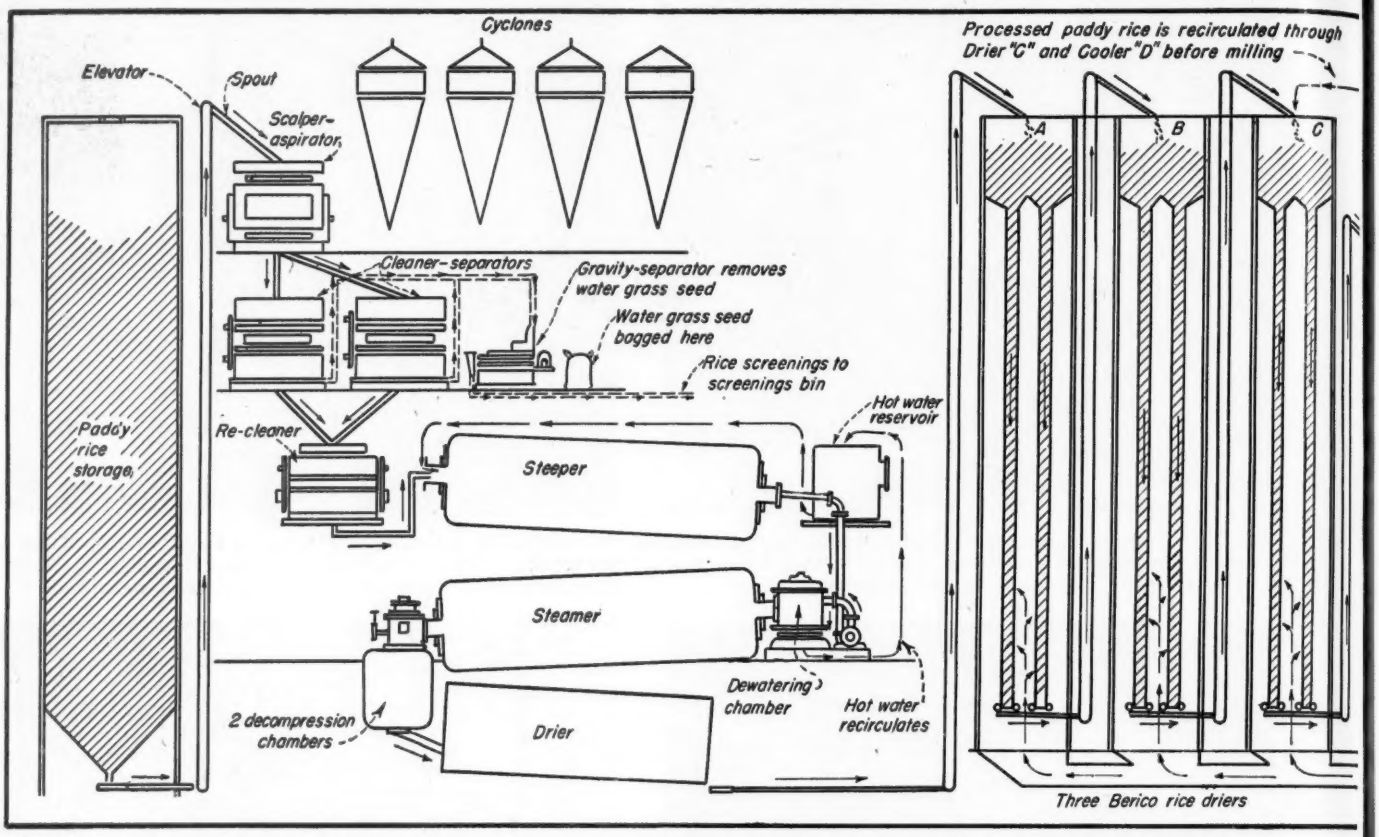


RICE flows from an adjustable feed-gate into the conveyor trough of a Berico drier. After passing through three Berico driers the rice is conveyed to cooling driers, then to tempering bins.

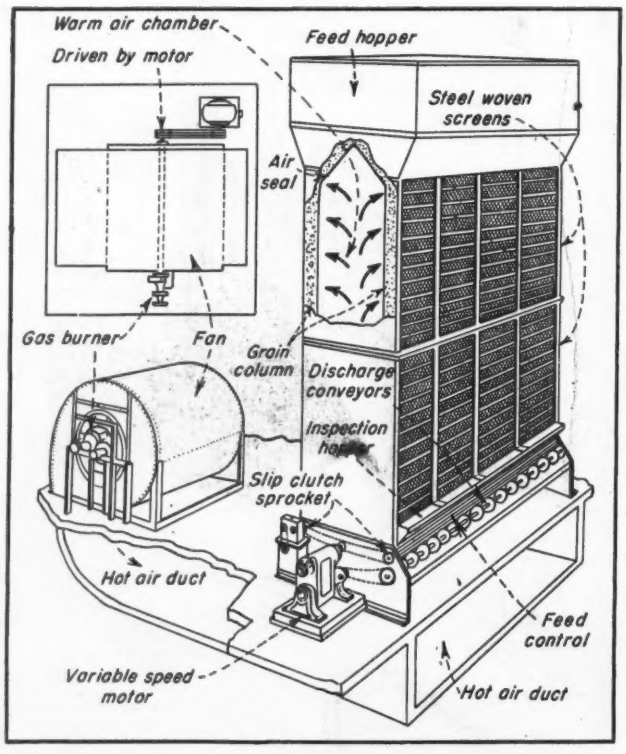
where it remains for 24 hours to equalize its moisture content. Before milling it is usually returned to one or more of the driers and coolers to dry it to a uniform 15 percent.

The clean, processed paddy rice first flows to the stone hopper and thence to one of the 12 shelling

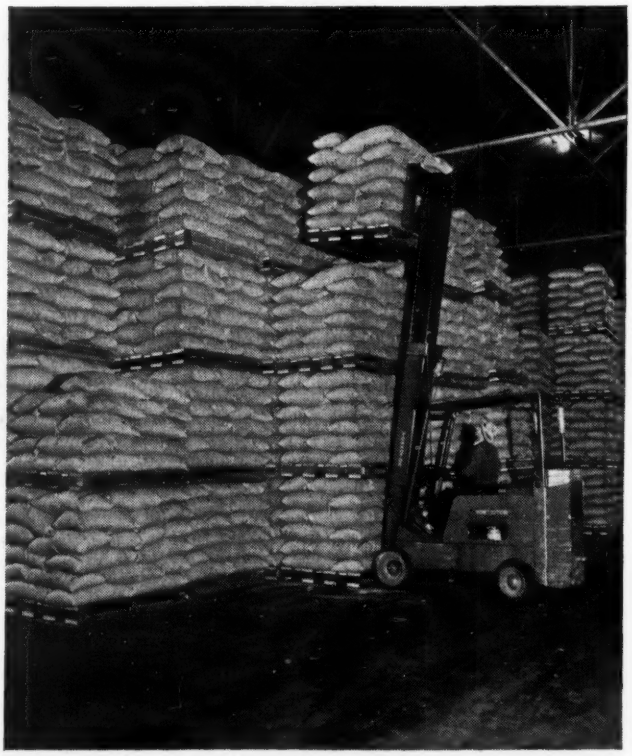
Flow Diagram Shows Sequence of Operations in the Production of Vitamin and Mineral



UPON ARRIVAL at the plant, rice is elevated to paddy rice storage bins. From here it is conveyed to a series of mechanical cleaners and aspirators, then batch-weighed ready for processing. After processing and drying the rice is stored in tempering bins to equal-



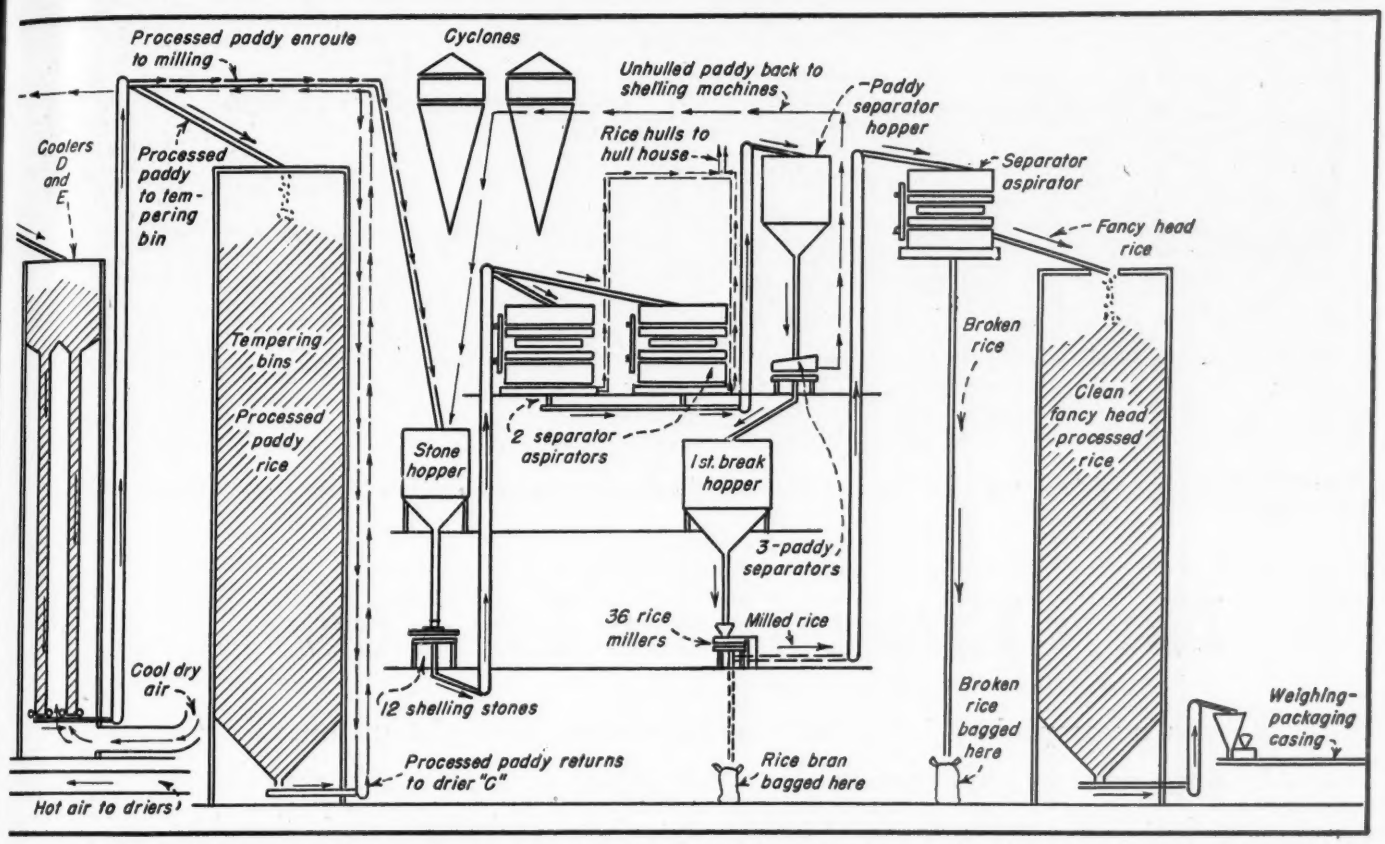
BERICO DRIERS expose the damp rice, descending through the grain columns, to warm air forced outward from the center.



STORAGE of the processed rice in bags is exclusively on pallets in this warehouse with a capacity of 200,000 100-lb. bags.

stones. Rice shellers consist of a stationary and an opposed plate, rotating at about 190 rpm., both plates mounted in a horizontal plane. Plates are of steel, about 5 ft. in diameter, and are coated on their inner surfaces with a mixture of cement and carborundum. The paddy rice drops between these plates and, when caught between them in a nearly vertical position, the hulls are cracked from the

Permeated Rice at the Plant of the Rice Growers Association of Calif.

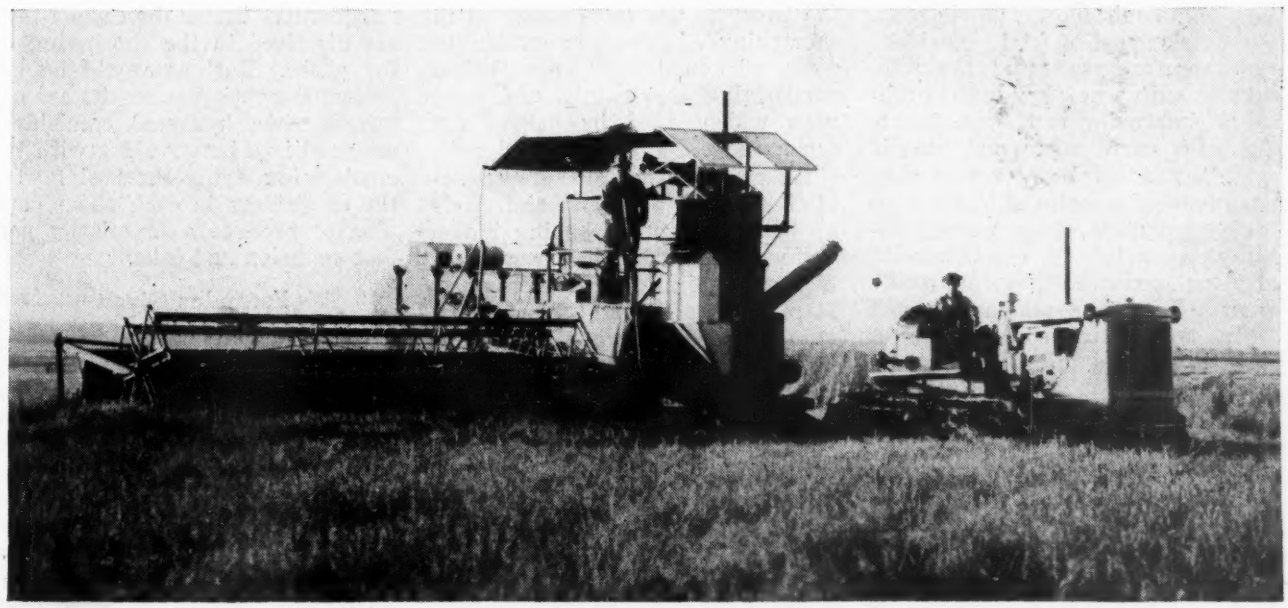


ize its moisture content. Prior to milling, it is again put through driers and coolers to reduce the moisture content to 15 percent. After conventional milling, the fancy processed rice is conveyed to storage bins. Cyclones are connected to every machine where dust occurs.

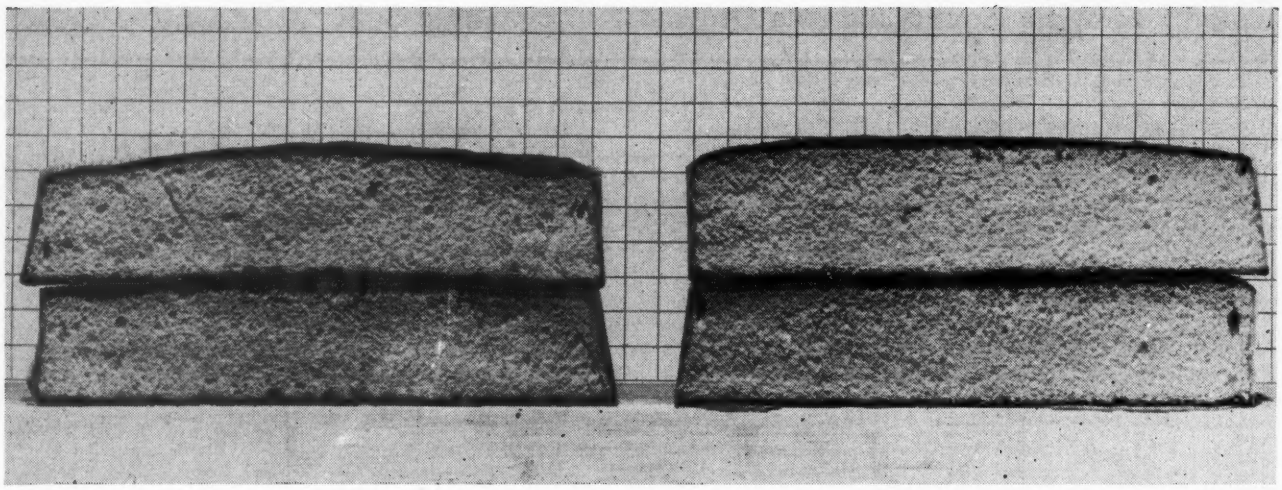
grains. It is then conveyed to a separator-aspirator where the hulls are separated from the grains. The grain goes to paddy separators and the hulls to a hull house to be ground for poultry feed and other uses. The paddy separators remove any unhulled grains, which are then routed back to the shellers. The shelled rice flows on to the first break hopper and thence into one of 36 rice milling machines.

Removing the Bran

The hulled rice flows by gravity into the milling machines, where a fluted cylinder, rotating at 500 to 600 rpm. within a stationary, hollow, perforated cylinder, scours the moving mass of grains against those nearest the surface of the perforated cylinder, removing the layers of bran from the rice. A huller blade, which extends into the packed mass of grains, further retards the motion of the rice, according to its adjustment, and creates a greater scouring action. The finished product is now ready for storage and finally for packaging.



HARVESTING of rice in California is done with combine and tractor. A large portion of the stock is stored in bulk.



SPONGE CAKE shows the difference in texture imparted by use of whipping agent in the batter. Left, regular formula; right, formula with whipping agent.

New Emulsifiers for Foods

Results accomplished by better understanding of emulsification in cake baking suggest application in other types of food emulsions: Salad dressing, ice cream, cheese, soups, gravies, puddings and the like

By N. F. JOHNSTON and H. H. FAVOR
R. T. Vanderbilt Co., Inc., East Norwalk, Conn.

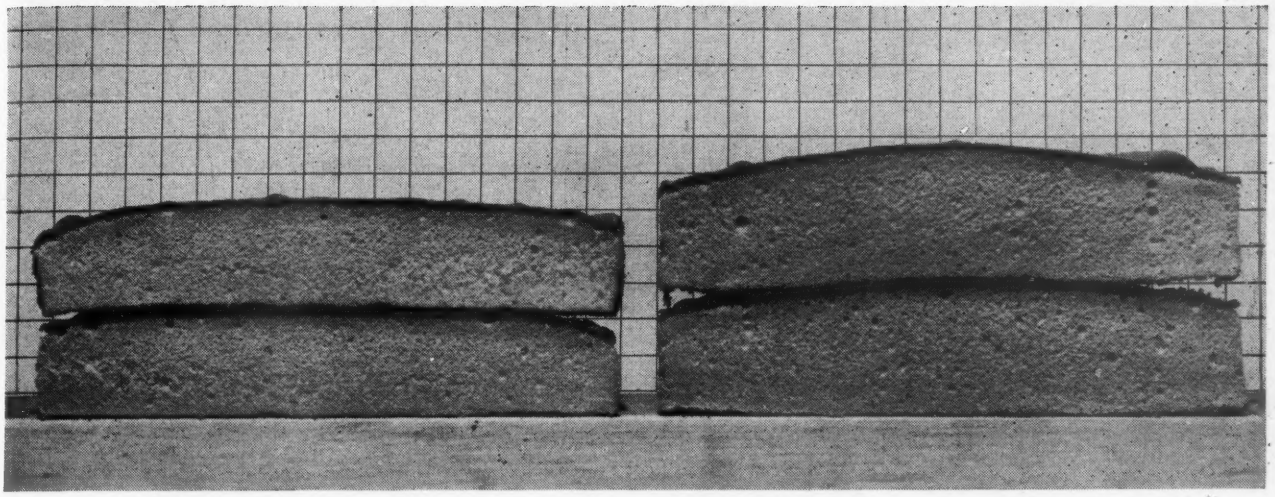
So many natural and prepared foods are emulsions that the subject of emulsifiers is of great interest to the food industry. Each year an ever increasing number of new chemical emulsifiers comes on the market, some of which have been found suitable for use in food. The development of food emulsifiers has therefore presented the food chemist with a new key to the problem of improving emulsions. Starting with corn sugar and stearic acid, the Atlas Powder Company has produced a series of bland, nontoxic emulsifiers whose water solubility is varied by reaction with alkylene oxide. These partially stearated sorbitol anhydrides and their polyoxyethylene derivatives were introduced to the food industry by the R. T. Vanderbilt Co., Inc., under the brand name "Vanade" and "Vanlite." Used principally as emulsifying and whipping agents in cake batters, they are regarded as a major improvement in the science of cake baking.

A cake batter is a good example of a complex food emulsion. The character of this emulsion can be improved by obtaining a better dispersion of the shortening throughout the water phase of the batter with emulsifying agents. Since the emulsifiers most useful in cake batters are oil-soluble and not soluble in water, it has been customary for the baker to use them dissolved in shortening. Shortenings containing dissolved emulsifiers are called emulsifying shortenings and have been widely used by bakers for some years.

Research on the value of the sorbitol anhydride esters and their modifications to the baking industry soon indicated that they could be dissolved in the shortening to form the emulsifying type of shortening; but that, when they were first hydrated and then added to the cake batter with the liquids instead of the fat, a vastly better emulsion and cake could be produced. Hydration was first necessary to put these relatively insoluble materials in a form that would mix into the batter readily but the results obtained far outweighed the convenience feature and showed that the incorporation of the emulsifier in the water phase of the batter was the significant step. Other emulsifiers, such as those heretofore used in emulsifying type shortenings, can also be hydrated and incorporated in the water phase of the batter to give results considerably better than when they are dissolved in the shortening or fat phase. But, as would be expected, the optimum results are obtained when hydrated emulsifiers are used in a batter along with the emulsifying type shortening, for the emulsifiers in each phase combine to produce a practically perfect emulsion and cake.

Formulas Given

Typical results obtained from the use of such emulsifiers are shown in the illustrations, the formulas used being shown in the table of data. The only formula change that may be necessary is a reduction in the proportion of shortening, for the esters have a tenderizing effect themselves and will produce too tender a cake if added to a high shortening formula. Most commercial formulas require no change ex-



YELLOW LAYER CAKE made with regular shortening, left, compared with cake made with emulsifier in water phase, right. Backgrounds reveal cake volumes.

YELLOW LAYER CAKE has increased volume and more uniform texture with emulsifier in fat and water phase, right, than when emulsifier is used in fat phase alone, left.

Formulas Used in These Test Bakings.

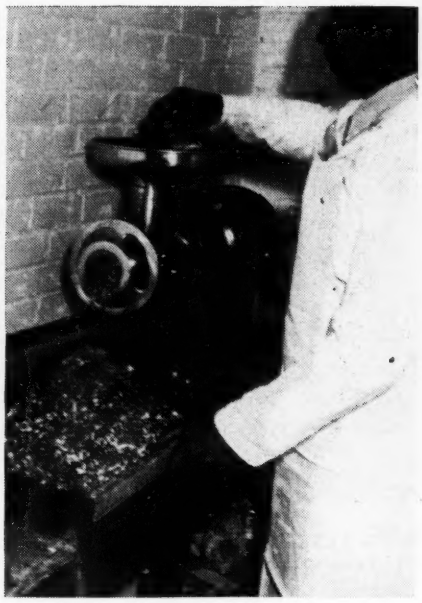
	Sponge Cake		Yellow Layer Cake			
	Regular	With Whipping Agent	Regular	Emulsifier in Water Phase	Emulsifier in Fat Phase	Emulsifier in Fat and Water Phase
Flour	100	100	100	100	100	100
Sugar	137	137	120	120	120	120
Fat	...	...	Reg. 35	Reg. 35	Emul. 55	Emul. 35
Emulsifier	...	8	...	4.7*	...	4.7*
Milk Solids	7.5	7.5	11	11	11	11
Salt	1	1	3	3	3	3
Baking Powder	1.87	1.87	3.5	3.5	3.5	3.5
Water	53	53	79	79	79	79
Eggs	80	80	60	60	60	60
Flavoring	0.1	0.1	0.1	0.1	0.1	0.1
Sp. gr. of Batter	0.510	0.475	0.795	0.690	0.710	0.605
Volume of Cake, c.c.	1220	1280	975	1150	1075	1225

*The quantity of emulsifier used in the water phase was increased from 3 to 4.7 to more nearly equal the quantity used in the fat phase.

cept the addition of the emulsifier. About 3 lb. of hydrated ester are used for each 100 lb. of flour in the formula, and are added at the first or creaming stage that contains all ingredients except the eggs. This is then creamed to maximum volume, the eggs added, and the whole is creamed to a maximum again. The effect of the emulsifying and whipping agent is readily apparent at this stage, for the batter is lighter and more glossy. The specific gravity of such a batter may be as low as 0.60 compared to 0.80 for one made without the emulsifier. Cake volumes show from 10 to 20 percent increases, the crust is smoother, the grain is finer and more uniform, and the eating characteristics are more moist and tender. Flavoring ingredients are more thoroughly distributed by the use of the emulsifier, resulting in noticeably better flavored cakes. All these improvements are of such a magnitude that even a novice can pick them out.

The success with which these new food emulsifiers are meeting in the baking industry suggests their broader application in other food emulsions such as: Salad dressing, ice cream, frozen foods, cheese, soups, sauces, gravies, condiments, flavors, fondants, nougats, chocolate, puddings and desserts.

PORK TRIMMINGS with a low fat-content should be used for making frozen sausage. If fat content is high, sausage becomes rancid after six months.



GRINDING PORK trimmings before adding and mixing the seasonings.

Extending Keeping Quality

Rancidity is retarded by smoking before freezing and by using sage, black

By IDA ATKINSON, S. R. CECIL, J. G. WOODROOF and ETHYL SHELOR, Georgia Experiment Station, Experiment, Ga.

SAUSAGE is one of the most difficult meats to freeze and hold in storage for more than a few months without changing quality. It is more difficult to preserve than unground frozen pork because grinding incorporates air into the sausage, increases bacterial content and stimulates undesirable enzyme activity.

On prolonged storage, the fresh, pink color of the meat changes to grey. At the same time a stale odor and flavor develops. Rancidity quickly follows, making the sausage inedible.

The causes for poor quality frozen sausage vary from plant to plant and are usually due to several interrelated causes. Some believe sausage should be frozen raw and unseasoned like other meats. Others believe it should not only be completely seasoned but cooked as well.

The storage life of frozen sausage is influenced not only by freezing but also by: (1) Length of time between slaughtering and making the sausage, (2) fat content, (3) type and amount of seasoning, (4) methods of manufacture prior to freezing, (5) type of package and method of packaging, and (6) freezing and storage temperatures. These and related subjects were studied for three years.

Methods and Materials

During these experiments hogs were obtained for three successive years from the Dept. of Animal Industry. Hogs were slaughtered, carcasses immediately chilled to 38 deg. F. and sausage made from one to three days later. The following standard formula was used for making the sausage:

Pork shoulder and trimmings	100 lb.
Salt	1 lb.
Black Pepper	4 oz.
Red Pepper	4 oz.
Sage	4 oz.

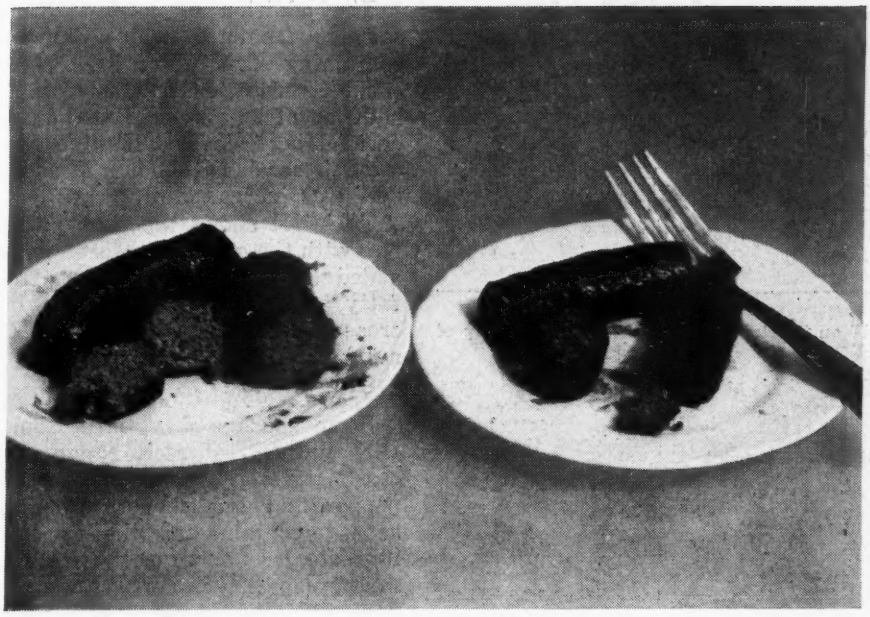
Pork shoulder and trimmings were ground coarsely, seasoning was added and the meat was reground. Seasoning was omitted from all of the control samples, and these samples were then ground twice.

Variations in formulas and special treatments are described under their respective headings. Duplicates and in most cases three or four samples of each lot were prepared. Each sample was packed to a ½-lb. net weight.

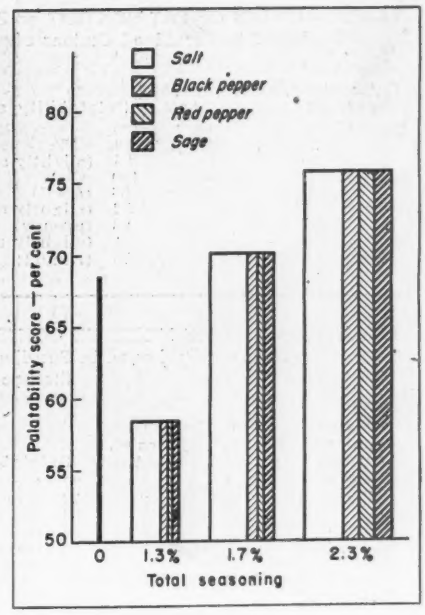
All samples were packaged in paraffined cups, unless otherwise indicated. Samples were then frozen immediately and stored at 0 deg. F. Organoleptic and chemical tests were made after 3, 6, 9 and 12 months' storage. Tests were also made on original samples prior to freezing. At each successive sampling period, uncooked samples were examined for changes in color and appearance, and seasoning was then added to unseasoned sausage before cooking.

Rancidity was determined by analyzing raw sausage meat for peroxide number (millimols of oxygen per kilogram of oil) and free fatty acid content (expressed as percent oleic acid). These values were interpreted and correlated with organoleptic results. The Wheeler modification of the Lea method was used to determine peroxide numbers. Free fatty acid values were obtained by titrating with an alcoholic solution of KOH at room temperature, using a solvent mixture of two parts of Skellysolve F and one part of neutralized alcohol containing phenolphthalein.

A standard cooking procedure was used. An 80-g. portion was



SMOKED SAUSAGE (right) has a longer storage life than unsmoked sausage (left). Smoked sausage is darker in color and its texture is firmer.



HEAVY SEASONING produces better tasting sausage. Rancid flavors are masked.

Of Frozen Pork Sausage

pepper or low fat-content trimmings. Salt and curing stimulate rancidity

taken from each sample, shaped into a ½ in. x 2½ in. x 4 in. loaf and divided into two patties. Patties were placed on a rack in an oven preheated to 375 deg. F., where they were broiled for 15 minutes. Cooking time was reduced slightly for samples which were partly dried or preheated prior to freezing.

Cooked samples were examined on the basis of appearance, color, aroma, texture and flavor. These qualities were assigned maximum values of 10, 10, 20, 20 and 40, respectively. Scores were totaled for comparison on the basis of 100 percent for maximum quality.

Fat Content

Preliminary tests indicated that deterioration occurred mostly in the fat portion of frozen sausage. In addition, the fat content influenced storage.

Table I summarizes the effects of fat content variations on the keeping quality of frozen sausage. Sausage with a fat content of 50 percent or higher was objectionably greasy, irrespective of freezing or storage. It became stale within a few months and rancid shortly after six months. Sausage containing 35 percent fat or less was excellent in texture, was rated "good" after six months and was only slightly rancid after one year.

The aroma and flavor of each lot of sausage became progressively less desirable with prolonged storage. On the other hand, the color and texture remained practically unchanged.

Chemical analyses showed no significant variation in oxidation with sausages containing different amounts of fat. Peroxide values and free fatty acid contents, however, increased after each successive examination.

Moisture Content

Tests were made to determine the effect of moisture content variations on keeping quality. Duplicate lots of high, medium and low fat-content sausage were dried in a current of air at 90 deg. F. for about six hours. Low fat-content samples lost more moisture than high fat-content samples with the same treatment.

This is the first of two articles on the factors influencing the keeping quality of frozen sausage. The second article, scheduled for the October issue, will show the effects of preheating, cooking, addition of antioxidants, packaging, and time and temperature of storage on the shelf-life of frozen sausages.—The Editors.

Prior to freezing, the high fat-content samples were objectionally greasy. Medium fat-content samples were slightly dry. Low fat-content samples had a dry, crumbly texture. All were slightly darker in appearance than undried samples. This difference, however, disappeared during cooking.

Table II shows that samples that were dried the least were the most palatable and contained the lowest peroxide and free fatty acid values during storage. All lots of undried sausage were preferred to corresponding lots of dried sausage, irrespective of other treatments.

The effect of drying on keeping quality of frozen sausage was more pronounced than fat content.

Adding Beef

Since ground beef is more stable in freezer storage than ground pork, it was believed that the addition of beef to sausage might prolong storage life, without adversely affecting eating quality.

One lot was frozen with no added beef. Other lots contained 5, 10 and 20 percent of lean ground beef. One lot of ground, unseasoned beef was frozen for chemical tests to determine the keeping quality of beef. All samples were shaped into rolls and packaged and sealed in Pliofilm.

TABLE I—EFFECT OF FAT CONTENT on Palatability and Chemical Rancidity of Sausage Packaged in Paraffined Cartons after 9 and 12 Months' Storage at 0 deg. F.

Fat content, percent	Storage, months	Palatability score, percent	Peroxide value	Free fatty acids (as oleic), percent
21.5	0	100	2.5	...
	9	89	21.0	1.98
	12	85 (slightly stale)	26.6	1.69
35.4	0	100	1.7	0.22
	9	86 (good)	23.3	2.11
	12	82 (slightly rancid)	26.3	2.00
54.8	0	98 (greasy)	0.1	0.26
	9	81 (slightly rancid; greasy)	19.7	1.62
	12	75 (rancid; greasy)	33.0	1.60

TABLE II—EFFECT OF MOISTURE CONTENT on Palatability and Chemical Rancidity of Sausage Packaged in Paraffined Cartons after 9 and 12 Months' Storage at 0 deg. F.

Moisture content, percent	Fat content, percent	Storage, months	Palatability score, percent	Peroxide value	Free fatty acids (as oleic), percent
35.4 (dried 3.2)	54.4	0	97 (greasy)	2.9	0.77
		9	72 (very stale; greasy)	17.8	1.37
		12	66 (rancid; greasy)	21.3	1.30
45.9 (dried 10.4)	37.6	0	96 (slightly dry)	1.3	1.21
		9	70 (very stale; slightly dry)	20.9	2.09
		12	62 (rancid; slightly dry)	23.7	1.85
48.6 (dried 25.4)	27.3	0	90 (dry; crumbly)	4.2	1.39
		9	66 (rancid; dry)	22.2	2.86
		12	51 (very rancid; dry)	27.6	2.48

TABLE III—EFFECT OF BEEF ADDED to Pork Sausage on Palatability and Chemical Rancidity after 9 and 12 Months' Storage at 0 deg. F.

Sample		Palatability scores			Peroxide number			Free fatty acids (as oleic),		
Pork, percent	Beef, percent	Orig. percent	9 mos. percent	12 mos. percent	Orig.	9 mos.	12 mos.	Orig. percent	9 mos. percent	12 mos. percent
100	0	100	100	90	0.7	3.5	5.3	0.38	0.56	0.60
95	5	100	98	78	0.4	3.0	3.7	0.42	0.93	0.87
90	10	100	95	77	0.5	4.4	5.0	0.48	1.17	1.13
80	20	98	93	69	0.7	5.5	6.2	0.60	1.68	1.75
0	100	...	...	...	0.8	..	..	...	18.80	18.10

TABLE IV—EFFECT OF SEASONINGS on Chemical Rancidity of Sausage Packaged in Paraffined Cartons and Stored for 6, 9 and 12, Months at 0 deg. F.

Seasoning	Outside color 6 to 12 mos.	Peroxide number 6 mos.	9 mos.	12 mos.	Free fatty acids (as oleic), 6 mos. percent	9 mos. percent	12 mos. percent
None	fresh pink....	3.1	14.5	3.1	.47	.37	.66
Salt	gray to white.	8.0	35.2	11.3	.34	.37	.48
Salt, black pepper	gray to white.	5.2	46.0	9.7	.35	.63	.77
Black pepper, red pepper	fresh pink....	1.7	12.2	2.7	.66	1.05	1.61
Salt, red pepper, sage	gray to white.	..	33.0	8.6	..	.55	.62
Salt, black pepper, red pepper, sage	gray to white.	5.9	15.3	9.3	.57	.62	.81

TABLE V—EFFECT OF SEASONINGS on Palatability and Chemical Rancidity of Sausage Packaged in Paraffined Cartons after 9 and 12 Months' Storage at 0 deg. F.

Seasoning	Palatability score 9 mos. percent	12 mos. percent	Peroxide number 9 mos.	12 mos.	Free fatty acids (as oleic), 9 mos. percent	12 mos. percent
None	79	66	14.6	...	1.55	...
Smoked salt	71	59	27.8	32.0	1.76	1.63
Salt	65	61	19.5	32.3	0.70	1.09
Black pepper	89	84	5.6	21.5	2.26	2.31
Red pepper	68	64	9.7	21.6	1.36	1.35
Sage	85	71	9.9	8.0	1.39	1.49
Salt, black pepper, red pepper, sage	87	82	23.3	...	2.11	...

TABLE VI—EFFECT OF INCREASING AMOUNTS OF SALT on Palatability and Chemical Rancidity of Sausage Wrapped in Pliofilm and Stored 9 and 12 Months at 0 deg. F.

Increase in salt over normal, percent	Storage, mos.	Palatability score, percent	Peroxide number	Free fatty acids (as oleic), percent
0	0	100	1.6	0.39
	9	100	2.7	0.57
	12	91	3.9	0.61
25	0	99 (slightly salty)	1.4	0.39
	9	89 (slightly salty)	2.9	0.53
	12	80 (slightly salty)	4.7	0.60
50	0	95 (slightly salty)	1.2	0.40
	9	83 (salty; stale)	3.3	0.54
	12	70 (salty; slightly rancid)	7.7	0.62

The addition of beef to pork sausage was not desirable. Samples containing five percent of beef could be detected by taste. The addition of 20 percent beef gave a decided beef flavor. Sausages became firmer as the amount of added beef was increased.

Table III shows that those samples with the greatest percentage of added beef had the highest free fatty acid values. Only slight increases took place in the peroxide numbers.

Types of Seasoning

Some sausage may be seasoned with nutmeg, allspice, cumin and cassia, as well as salt, sage, black pepper and red pepper. Country sausage contains only the last four ingredients. Consequently, two different experiments were set up to determine the effect of salt, black pepper, red pepper and sage on the keeping quality of frozen sausage.

In the first set of experiments, different combinations of seasoning were mixed with the sausage before freezing, as shown in table IV. When thawed for examination, omitted seasonings were added prior to cooking. Based upon the weight of the ground pork, the following were added:

Salt .....1.00 percent
Black pepper .....0.15 percent
Red pepper .....0.15 percent
Sage .....0.15 percent

Results indicated that salt accelerated rancidity, and black and red peppers together did not stimulate oxidation, but accelerated the formation of free fatty acids. Unseasoned sausage showed up better in chemical determinations than seasoned sausage. The reverse was true to a slight extent in palatability tests because seasonings cover up the rancid flavor.

A total of seven lots of sausage was prepared for the second experiment, conducted the next year. Lots were unseasoned, completely seasoned and seasoned with each of the four seasoning ingredients and also smoked salt. Based on the weight of the meat, the following amounts of seasoning ingredients were used:

Salt .....1.30 percent
Black pepper .....0.26 percent
Red pepper .....0.16 percent
Sage .....0.26 percent

After each examination, omitted seasoning ingredients were mixed with sausage before cooking.

After six months all samples were similar in appearance, color and texture. The smoked salt sample had an off-flavor, while the salt sample had a stale flavor and was

judged the least desirable of all lots. The sage sample was best and black pepper sample next.

Differences in flavor only were more pronounced after nine months. Samples containing smoked or table salt were rancid and unacceptable. Sausage with black pepper, sage or all seasonings had the best flavor.

All samples were rancid and unacceptable after 12 months, except those containing black pepper, sage or all seasonings. Samples containing salt were the most rancid, and peroxide values correlated with the palatability scores. Consequently, salt accelerates rancidity, sage and black pepper are good antioxidants and red pepper has some value in preventing oxidation.

Amount of Seasoning

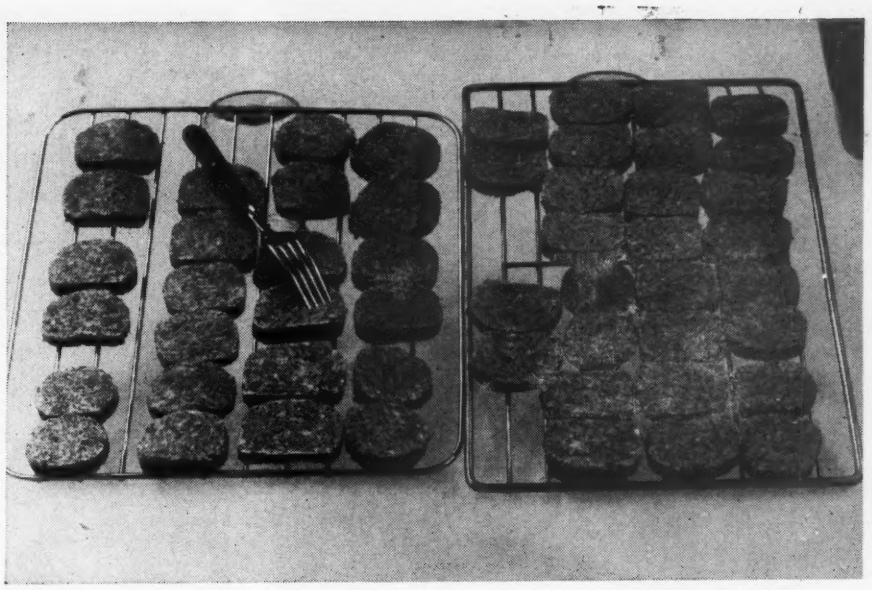
The effect of increasing the amount of salt and sage on the keeping quality of frozen sausage was determined by adding 25 to 50 percent more of the two seasonings. Control samples were completely seasoned. All samples were shaped into rolls and packaged in Pliofilm.

Table VI shows a progressive decrease in palatability scores and a progressive increase in peroxide numbers and free fatty acids with each increase in salt and storage time.

Table VII shows higher palatability scores and lower peroxide values when 25 percent additional sage was added. Peroxide values were further decreased when 50 percent sage was added, but the sample had a pronounced sage flavor. Sage gradually loses its flavor during storage. Consequently, sausage held more than six months should have more sage than sausage consumed within a few weeks.

Intensity of Seasoning

All seasonings were added to sausage at different levels. Heavy seasoning produced a better tasting sausage due to the protective action of greater portions of sage and black pepper and the tendency to mask rancid flavors. Table VIII shows that lightly seasoned samples had higher rancidity figures than unseasoned samples. This is probably due to the inability of the limited amounts of sage and pepper to counteract the adverse effects of salts.



SAUSAGE READY to be cooked for palatability tests. Slices are cut from center of sausage rolls. Lots have different amounts of beef, seasoning and antioxidants.

Smoking and Keeping Quality

For two consecutive years, lots of seasoned sausage were hickory-smoked for 24 hr. before freezing. Unsmoked sausage links were frozen for comparison. Results of palatability and chemical tests were consistent for the two years, as seen in table IX.

Smoking did extend keeping quality by almost doubling the storage life of frozen sausage. After one year palatability scores were 92 for smoked and 43 for unsmoked sausages.

Technical Paper No. 171, Journal Series, Ga. Experiment Station.

TABLE VII—EFFECT OF INCREASING THE AMOUNT OF SAGE on Palatability and Chemical Rancidity of Sausage Wrapped in Pliofilm and Stored 9 and 12 Months at 0 deg. F.

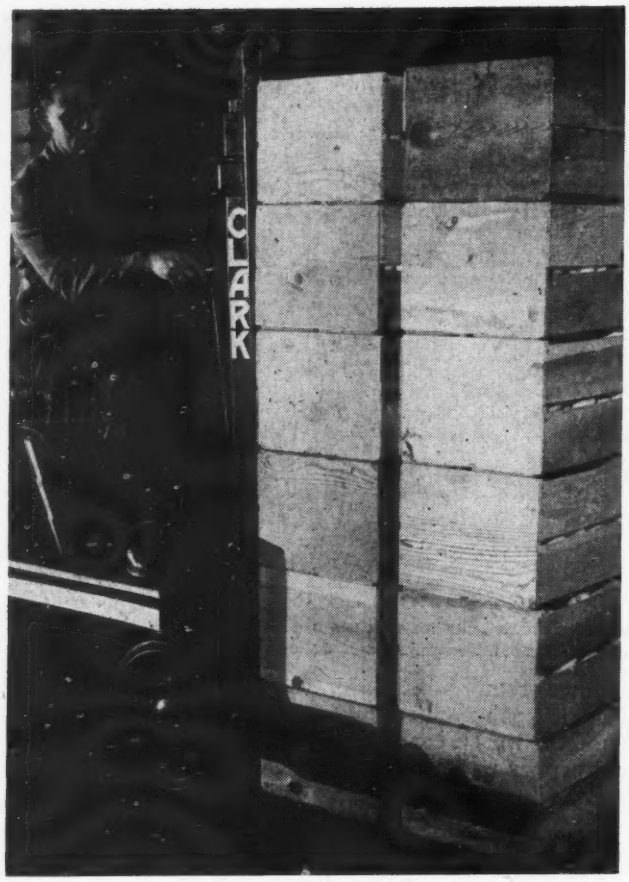
Increase in sage over normal, percent	Storage, mos.	Palatability score, percent		Peroxide number	Free fatty acids (as oleic), percent
0	0	100		0.8	0.38
	9	100		4.3	0.55
	12	90		6.0	0.59
25	0	100		0.9	0.37
	9	100		2.0	0.59
	12	95		3.0	0.62
50	0	98	(too much sage)	1.1	0.37
	9	96	(too much sage)	1.4	0.59
	12	90	(too much sage)	2.2	0.59

TABLE VIII—EFFECT OF INTENSITY OF SEASONINGS on Palatability and Chemical Rancidity of Sausage Packaged in Paraffined Cartons and Stored at 0 deg. F. for 9 and 12 Months.

Seasoning		Palatability score		Peroxide number		Free fatty acids (as oleic),	
Intensity	Percent	9 mos. percent	12 mos. percent	9 mos.	12 mos.	9 mos. percent	12 mos. percent
None	0	84	68	14.6	3.1	0.96	1.10
Light	1.3	71	58	33.8	19.1	2.11	2.12
Medium	1.7	81	70	18.0	8.4	1.82	1.81
Heavy	2.3	84	76	6.7	3.3	1.37	1.82

TABLE IX—EFFECT OF SMOKING SAUSAGE for Freezing on Palatability and Chemical Rancidity after Packaging in Paraffined Cartons and Storing for 6, 9 and 12 Months at 0 deg. F.

Sample	Storage period, mos.	Palatability score Exp. 1, percent		Palatability score Exp. 2, percent		Peroxide number Exp. 1	Peroxide number Exp. 2	Free fatty acids (as oleic), Exp. 1, percent	Free fatty acids (as oleic), Exp. 2, percent
Unsmoked	6	90	(med. gray; slightly stale)	.....		5.9	...	.57	...
Unsmoked	9	80	(whitish gray; stale; oxidized)	63	(very stale; slightly acrid)	15.9	24.7	...	1.40
Unsmoked	12	46	(rancid)	40	(rancid)	21.3	22.6	7.55	1.10
Smoked	6	95	(good texture; excellent flavor)	.....		...	...	...	...
Smoked	9	92	(good texture; very good flavor)	93	(very good texture, flavor)	2.8	1.6	...	2.90
Smoked	12	92	(no off-flavor)	93	(same)	0.9	...	5.80	...



LIFTING STACKS of crates and field boxes without recourse to palletizing, the Clamp-Lift uses hydraulically actuated, self centering clamps, which hold the unit load while the stabilizer exerts sufficient pressure on the top to hold boxes intact. Built around a fork truck, the device has handled from 5,000 to 6,000 boxes of lemons in a regular eight-hour working day.

How to Palletize Produce

New "Clamp-Lift" device handles boxes of fruits and vegetables without pallets—

CRATES and field boxes of fruits and vegetables can now be handled in unit loads without pallets by means of a new device which has been developed by R. H. Braun, materials handling representative of Los Angeles, and W. R. Bailard, president of the Ventura Coastal Lemon Co., Ventura, Calif. The device, known as the "Clamp-Lift," is a power-operated, self pressure-equalizing clamp arrangement together with a stabilizing unit, which is built around Clark Trucloader fork trucks.

Handling Multiple Stacks

Multiple stacks of boxes and crates are securely held during lifting by hydraulically actuated clamps of self-centering type. At the same time a stabilizer exerts sufficient pressure to hold them intact for safe movement and handling.

The original application of the Clamp-Lift was made for handling both lug boxes and crates of lemons at the Ventura Coastal Lemon Co. One operator, using this new device consistently, handled from 5,000 to 6,000 boxes of lemons in eight hours. Lug boxes of fruit arrive by trucks from fields where lemons are being picked. They are unloaded and stacked on the receiving platform.

Each grower's fruit is handled through the washing operation during a single run. Consequently, truck loads must arrive from several different growers at the same time and be separated and stored on the receiving platform until each unloading operation is completed.

In addition to more rapid unloading of trucks, the Clamp-Lift also facilitates tiering of field boxes on the receiving platform. Consequently, more storage space is provided and less confusion occurs.

When all the fruit from one grower has been received, it is transported to the washing machines. In the case of lemons, this operation also includes grading for color but not for size. Unlike oranges, lemons are not graded for size and shipment before cold storage.

Stacking Cases in Cold Storage

The lemons are then held in cold storage. The old method involved stacking full crates, nine high, using a 2-wheel clamp truck. To place the last two or three crates on the top of the stack, it was necessary for the worker to stand on another crate. During peak periods, it was sometimes necessary to stack cases ten or twelve high to utilize maximum ceiling heights.

The Clamp-Lift device can handle

THIS LIFT not only makes possible the rapid unloading of trucks, but speeds tiering and piling of field boxes on the receiving platform. As can be seen here, piling becomes a simple operation, the lift leaving a 2-in. space between stacks and a 4-in. space on either side of the rows. When cases must be piled high, the double stack unit loads are tiered one on top of the other.

Without Using Pallets

Clamps hold boxes securely for lifting, while stabilizer exerts pressure on top

two stacks, each containing nine cases, or a total of eighteen cases, in one operation. It can also pile cases in the conventional manner with a 2-in. space between stacks and a 4-in. space on either side of the rows. These spaces allow the circulation of air and gases for controlling temperature. If cases must be stored ten or twelve high, it is more efficient to handle double stacks or five or six cases at one time and tier such unit loads on top of each other.

Handling Lemons in Storage

For cold storage operations, use of a battery-powered electric fork truck, such as the Elec-Trucloader, was found desirable. It did not add to the thermal load and eliminated the possibility of odors contaminating the fruit.

At a later date crates of lemons are transported from cold storage to packing rooms. There the fruit is graded for size, wrapped in some instances, and then finally packed for shipping.

The full cases, bulging slightly on the top, are handled on head, end on end. The old method, using a 2-wheel hand clamp truck, enabled units of four cases, two wide and two high, to be handled with one move. With the Clamp-Lift, units of eight or twelve cases can be handled with one move.

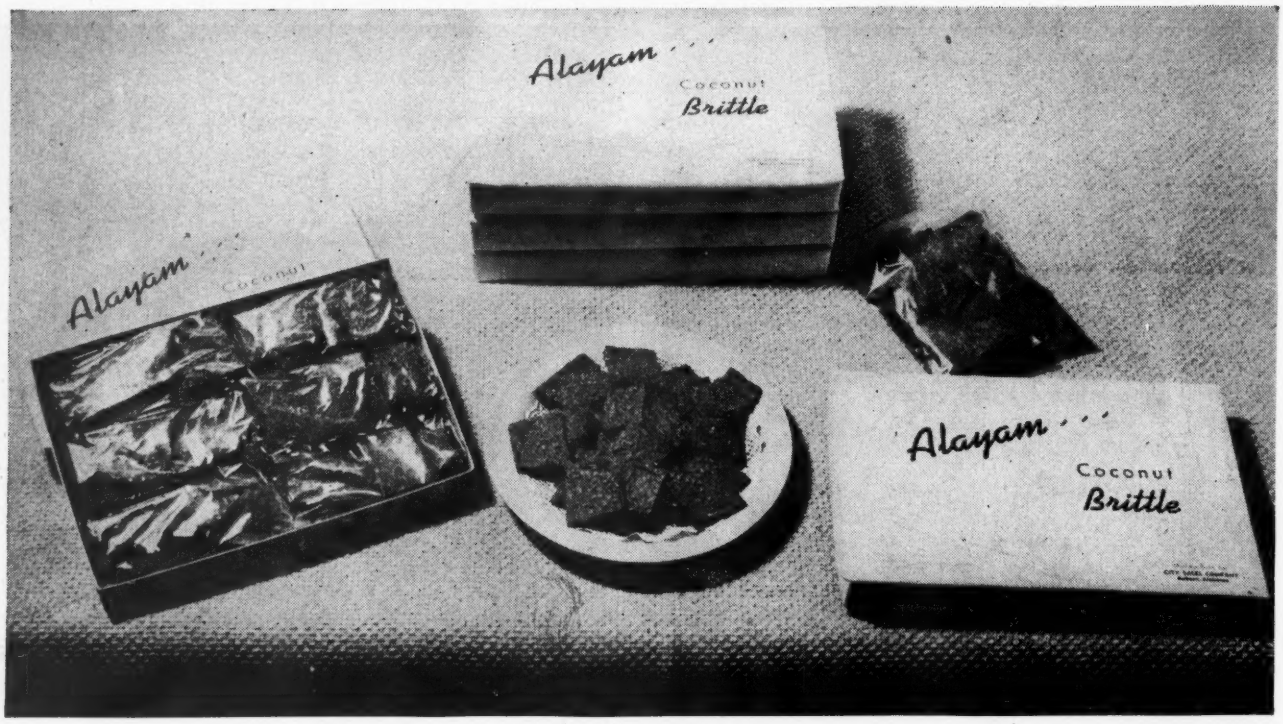
Handling Other Fruits

The method described for handling crates of lemons can also be used for oranges. The receiving operations for handling boxes of oranges are the same as for lemons. After washing, however, the oranges are waxed, graded both for size and color, and packed for shipping before being placed in cold storage.

While these operations have been developed for handling citrus fruits, the same handling savings can be accomplished in many other fields, wherever it is necessary to handle lug boxes or crates of fruits, vegetables or produce.

Advantages

The new Clamp-Lift offers many opportunities for savings. For example, no investment is required for pallets and there is no subsequent cost of pallet maintenance. Cost for returning empty pallets is also eliminated. Maximum utilization of air space is provided through tiering, making economical use of available floor space. Loading and unloading of highway trucks and box cars, and movement of fruits and vegetables into and out of cold storage rooms can be accomplished in a fraction of the time now required.



ALAYAM BRITTLES, made with fully cooked sweet potato puree, sugar and other ingredients, when given a short public-acceptance test, rated with the best of fine brittles. They were made at a profit although most of the operations were performed by hand.

Candies from Sweet Potatoes

Whether used as a cooked puree in brittles, or as flour in cream centers,

By MILDRED S. VAN de MARK and L. M. WARE, Alabama Agricultural Experiment Station Auburn, Alabama

CANDIES having high quality, taste appeal and varied food values have been made from sweet potatoes at the Alabama Agricultural Experiment Station. They have been tested by a large number of qualified people and have been pronounced excellent. A limited sales test has been conducted with satisfactory results.

Discussion of the forms in which sweet potatoes may be used in the production of candies, the characteristics of the candies and the confectionery properties as a candy ingredient bring out some important points.

Three Methods

Several methods have been developed for making acceptable candies from sweet potatoes: (1) By use of the fully cooked puree to make brittles; (2) by use of the cooked and toasted product reduced to a flour, Alamalt, as an ingredient in soft fillings and (3) by use of the puree in soft candies. Quality of the candies produced from the third method has not been very good.

A very fine type of brittle was made by using equal parts of sugar, coconut and fully cooked sweet potato puree. In a short market-acceptance test it was rated with the best of the fine brittles and was made at a profit although most of the operations were performed by hand.

Flour Used

The flour has been used to make pecan rolls, pralines, coconut bars, peanut bars, and similar products; and in cream centers of carmel, pineapple, coconut, peppermint, and maple candies. These candies rate with the best on the market in the several classes. They are not cheap substitutes.

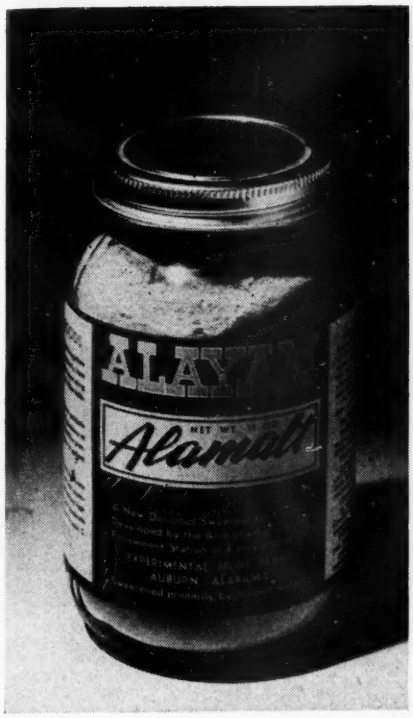
Work already conducted at the Alabama Station has shown that ingredients having high health values may be added to candies without affecting their taste appeal. The brittles especially offer possibilities. Some of the combinations that have been made, tested and pronounced good are: Sweet potatoes and coconut; sweet potatoes, coconut and orange; sweet potatoes, coconut, and wheat germ; sweet potatoes, coconut and corn germ; sweet potatoes, coconut and soybean meal.

In these combinations, sweet potato dominates the texture and flavor. The flavors of such ingredients as soybeans or wheat germ, which have low palatability when used alone, are masked. Sweet potatoes and coconut make an excellent blend and give a fine candy. The addition of soybeans or wheat germ does not lower the quality or the palatability. It would strengthen candy's position with nutritionists.

Health Promoting Values

A candy containing such ingredients as sweet potatoes, coconut, and wheat germ offers a variety of food values. The sweet potato provides carbohydrates, carotene or provitamin A and minerals; the coconut provides oils or fats; the wheat germ provides protein, vitamin B_1, B_2 and E, and minerals. This combination does not develop high rancidity characteristics.

The method of making a brittle



ALAMALT, a fully cooked sweet potato flour, has been used in cream centers.

"Sweets" as Candy Boosters

Confectioners have been disturbed for some years over the fact that candies provide, primarily, an energy food. They have tried to correct this shortcoming by the addition of various high-protein or high-vitamin meals such as wheat germ, corn germ and soy bean meal. The flavors of these meals, which have low palatability when used alone, are masked by the sweet potato.

The Alabama Agricultural Experiment Station has accordingly conducted extensive experiments with the use of sweet potatoes in candies. The results may be summarized as follows:

1. The sweet potato is not a cheap or low-cost ingredient. It will cost more than sugar.
2. As an ingredient in candies it is not a substitute. It is a new ingredient, having unique properties and values in candy making, and when used with a knowledge of its properties it will add a valuable ingredient to the candy makers' list. It does not require the application of knowledge and skill in its use.
3. Candies of fine quality can be prepared from sweet potatoes.
4. They may be used in low-quality candies if that is the objective.

Sugar is the base material in candies; its cost is very low. The same sugar value cannot be supplied as cheaply from sweet potatoes as from standard sugars, even at normal prices for potatoes. Cheapness will not be the sweet potato's chief value. It is not, however, a high-cost ingredient when manufactured in large quantities.

Pack Health-Promoting Values

bars or pralines, sweet potatoes add carotene, vitamins and minerals

with sweet potatoes is simple. Sweet potatoes are baked, peeled and pulped; the coconut and other ingredients are added and mixed. The mixture is extruded onto trays and toasted in an oven having carefully controlled temperature, humidity and air velocity. The product has an attractive deep orange color, is crisp and brittle, and compares favorably in taste and quality with any brittle on the market today. It has been named Alayam Brittle.

Alayam has also been used in the manufacture of a number of breakfast foods, taffies, cookies, spreads and garnishes.

Pralines

A very good praline may be made of brown sugar, sweet potato flour (Alamalt) and pecans. It differs in three respects from those made and sold in the New Orleans area. The sweet potato praline will be almost grainless, will not dry out as rapidly, and will not become hard as the praline made the usual way. To those accustomed to the graininess of the New Orleans praline, the smooth texture of the praline with the sweet potato flour might not be as desirable. In a new area, however, the smooth texture might have distinct advantages.

Hard Candies

Two other types of candies made with the fully prepared sweet potato flour may be mentioned. One is a hard brittle and the other a "chewy" type of gum candy. The difference in type results from differences in temperature of the sirup and the length of time that the flour is in the sirup before it is cooled. A matter of seconds influences markedly the type of candy obtained. In each case the temperature of the sirup is raised to a certain boiling point and the flour added. If the flour is added at a certain temperature and the boiling continued for one or two minutes, a hard brittle candy is obtained; if added at certain other temperatures, just as it is taken from the stove, a "chewy" type of gum candy is obtained.

Rolls and Bars

Alamalt is especially well adapted to peanut or coconut bars and pecan rolls. A surprise awaits one when he first samples a chocolate-coated peppermint cream candy. The imagination is taxed to believe that the principal ingredient is sweet potatoes.

As an ingredient in bakery items, Alamalt has been found especially good for fruit cakes, layer cakes, Southern brown bread, cookies, biscuits, muffins and pies. Cakes in which it is used are fine in texture and grain, have an elastic quality and hold moisture about twice as long as plain cakes. A clear orange color is given to light-colored cakes.

Cake icings containing Alamalt are smooth and creamy in texture and retain their freshness longer than when made with standard ingredients.

Further Research

The subject of candy making with sweet potatoes is broad. This discussion can only serve the purpose of introducing and of suggesting some types of candies that may be made from them. Further research should reveal many other types of candies and different ways in which the sweet potato may be used.

TASTE PANEL evaluating packaged frozen foods at various intervals during storage. Nutritionists, chef and taste experts work together at Honor Brand test kitchen. Frozen packaged foods are examined in the cooked and uncooked state.

How A Food Packaging

Test your packaging materials and determine product shelf-life. Make production

By JOHN V. ZIEMBA
Assistant Editor
"Food Industries"

THE packaging laboratory should determine how a product must be packaged and what packaging materials may be used. Laboratory and performance tests must be made to find out if product quality is maintained with the use of a new package, whether the package is unserviceable or in any other way inefficient. Packaged products should be handled under conditions simulating production, storage, distribution and dealers' shelf handling.

Before contracting for packaging materials or equipment, it is necessary to: (1) Test the packaging materials; (2) decide upon the size, shape and appearance of the package; (3) determine the shelf-life of the product in the new package; (4) make plant runs under actual operating conditions; (5) conduct organoleptic tests by a taste panel, and (6) conduct shipping, distributing and consumer acceptance tests.

Selecting Packaging Materials

Care must be exercised in planning packaging tests. Before packaging tests are made, the plant should decide upon the general size, shape and appearance of the package. As many as a dozen or more different types of packages may be suitable for one product. Often an individual supplier can furnish other materials which do not have the functional property of the higher cost material, but lend themselves to less costly packaging operations.

After laboratory and performance tests are made, all packaging materials must be evaluated to determine which are satisfactory and what materials should be rejected. A rating should be made of all packages, listing them in order of preference, before a final choice is made.

All packaging materials tested should be listed in terms of their commercial designation, suppliers' name, material specifications and material index number. Where wrappers are used, different methods of applying the wrapper must be employed to obtain a complete and close adherence to the product. For example, butcher and drug store wraps should be used. All wrappers must be sealed with Scotch tape, tied with string or heat sealed, depending upon whether the wrappers are heat-sealable. A sufficient number of properly identified packages should be held in storage, so that periodical inspections and analyses can be made.

Products packed in cartons must have uniform weights to eliminate head-space and net weight content variations. Cartons used for frozen foods must be filled to provide the right amount of head-space for freezer expansion to eliminate carton distortion. Different materials should be considered in the fabrication of cartons. Among these materials are plastics, special laminates and specially coated papers.

Testing Packaged Frozen Foods

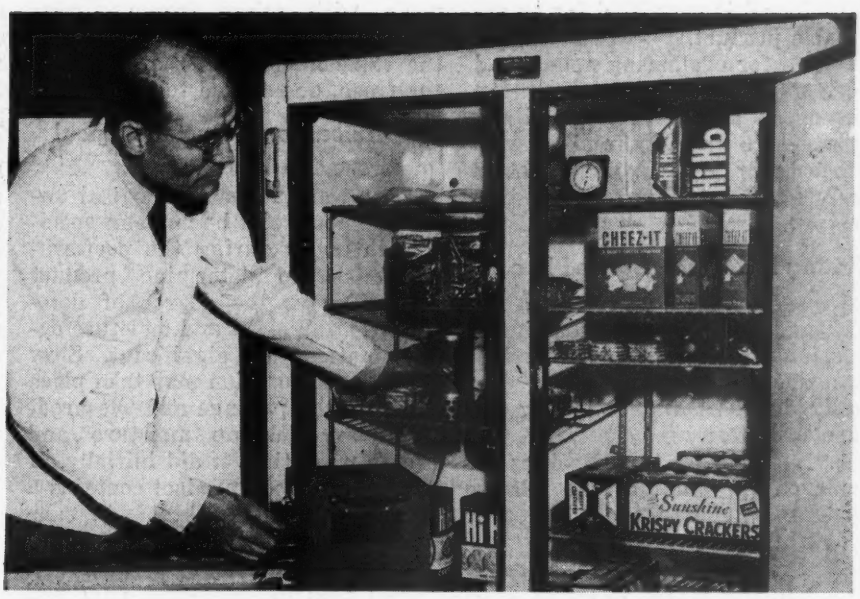
Package testing methods vary with the product packaged. For example, with frozen foods it might be well to conduct the following performance test:

"Sharp" or quick freeze the packages for the time required to attain the internal product temperature desired. While freezing the packages, determine the freezing rates by taking internal product temperatures with the aid of a potentiometer. Many packaged foods, frozen

This is the last of three articles on the purpose, location, organization and operation of the packaging laboratory in food processing plants. Previous articles published in FOOD INDUSTRIES showed difficulties encountered due to inadequate packaging, how suppliers can help with packaging problems and how to set up and organize a food packaging laboratory in the plant.—The Editors.

U. S. Army Signal Corps photo

HIGH TEMERATURE and humidity room, designed to test packaged foods.



Sunshine Biscuits, Inc., photo

ADJUSTABLE HUMIDITY cabinet for creating any type of weather conditions for testing packaged bakery products to assure consumer acceptance.

Laboratory Functions

runs and then conduct shipping, distributing and consumer acceptance tests

in a specific freezer, freeze at different rates, depending upon product and the package used.

Hold the frozen samples in a low temperature cold storage room to measure product reaction to freezer storage (0 deg. F.). A sufficient number of samples must be held in storage so that samples can be inspected and analyzed at monthly intervals for six months or longer. Simultaneously, packaging materials must be appraised for the purpose of selection or elimination.

Make periodic weight determinations in the cold storage room. At the same time submit samples to the control laboratory for chemical and bacteriological analyses and to the experimental test kitchen for organoleptical evaluations by taste testers. These results will all aid in the evaluation of the packages.

Undertake shipping and distributing tests after samples have been in storage, for 3, 6 or 12 months, depending upon the guarantee period established for the product. Determine the reactions of frozen foods held in either low temperature, self-service display units or home-style, freezing units. Quality changes, together with package performance, can be investigated by holding frozen products in these units for maximum periods under varying temperatures.

Testing Packaged Fresh Foods

Performance test procedures for fresh packaged foods differ somewhat from those for frozen foods. Packaged fresh fish and meats, for example, must be packed in suitable shipping containers and held in a 32 to 40 deg. F. cooler for 24 hours to simulate plant storage. Higher temperatures must be used for fresh produce. The variety of fruit or vegetable will influence the storage temperature to be used.

Next, the products must be held for four hours at 100 deg. F. and a 90 percent relative humidity to simulate railroad car or truck loading conditions. Straight refrigerator car shipments are simulated by holding fish and meats for four days in a 32 to 40 deg. F. cooler; higher temperatures for produce. Products must then be stored four hours at 100 deg. F. and a 90 percent relative humidity to simulate railroad car or truck unloading.

Warehouse storage must be duplicated by holding fish and meats in a 32 to 40 deg. F. cooler for four days; higher temperatures for fresh produce. To simulate distribution to retail stores, products must again be held for four hours at 100 deg. F. and a 90 percent relative humidity. Products must then be stored in service and self-service display cases until product failure, as determined by chemical, bacteriological and organoleptical tests. The same tests should be made during various stages of the performance tests.

Rating Frozen Uncooked Food

Frozen, packaged foods, inspected at various intervals for spoilage, are evaluated on the basis of:

1. Degree of surface dehydration.
2. Appearance and color. Oxidative changes encountered during processing and storage result in surface discoloration. Some frozen products may be enhanced in appearance and look superior to the original product.
3. Internal odor.
4. External odor.

Frozen products in cold storage not only lose some of their natural flavor and odor, but they may also acquire foreign odors and flavors.

Organoleptical evaluations are generally made on a scoring basis and differ with companies. Evaluations of the above four factors may be made on the basis of scoring each factor 25, and using a further scoring system of excellent—25, good—20, fair—15, poor—10, bad —5 and rejected—0. In arriving at a score of 75 as a minimum acceptable, no more than one factor out of four can be rated 15. No rating

of 10, 5 or 0 is permitted for an acceptable product.

Panels for evaluating non-cooked foods must consist of at least five persons. It is preferable that three persons be technically familiar with evidences of product deterioration likely to be encountered in testing packaged foods.

Rating Fresh Non-Cooked Foods

Inspection for spoilage of fresh, packaged products at various intervals, simulating storage, distributive and marketing methods, generally involves the following organoleptic tests:

1. Surface moisture. Ratings are made on the basis of the relative amount of moisture or degree of dehydration.

2. Degree of mold growth or surface slime. When evaluating, it must be specified whether mold or surface slime conditions are slight, moderate or extensive.

3. Color. It must be stated whether the color is satisfactory for marketing and what gradations in color changes have taken place. Evaluation of color must be made on the basis of the surface normally exposed for consumer acceptance.

4. Odor. Comments must indicate whether the product is sour, putrid, yeasty, rancid, aged or if odors are transmitted to the product through or by the packaging material.

For each of the above factors considered, individual ratings of excellent—25, good—20, fair—15, poor—10, bad—5 and rejected—0 may be given. In arriving at a total score of 75 as a minimum acceptable, no more than one out of four can be rated 15. Ratings of 10, 5 or 0 are not permissible on an acceptable product.

Rating Cooked Foods

Samples of packaged fresh and frozen foods must be submitted at regular intervals to the test kitchen to be evaluated in the cooked and non-cooked condition. In the test kitchen, trained nutritionists carry the test procedure through to the ultimate consumption of the product. Cooking is conducted under designated conditions. Cooked products are evaluated in accordance with the following scheme: (1) Appearance, (2) internal odor, (3) external odor, (4) flavor, and (5) tenderness and juiciness. As a supplementary test, loss of moisture and meat juices are determined by weighing frozen meats before cooking and after cooking and draining. Weight loss determinations are made with other frozen foods. Cooked products are then scored in the same manner as that outlined for fresh, non-cooked foods.

Chemical and Bacteriological Tests

Chemical and bacteriological analyses should also be made at specified intervals during the performance test to determine product protection or the degree of deterioration. Weight and moisture determinations are significant. Slow moisture absorption may take place through the package and the product may pick up moisture and weigh more than it did initially. If a powdered food product contains a hygroscopic material, it will cake up or harden.

Some products lose moisture. When this happens, not only will the quality of the product be adversely affected, but the net weight contents of packages will also vary considerably at the time of sale, and short weights may result.

Rancidity shows up in stability tests and products should be analyzed for peroxide values and for free fatty acids. Under some conditions the product may have a rancid odor, yet chemical tests indicate that the product is not rancid. Certain substances in packaging materials, particularly non-greaseproof liners for cookies, accelerate the formation of rancidity in the grease picked up by the liner. Fats and oils absorbed by the liner are rancid, but the product is not rancid.

If and when decided important, analyses should be made for free ammonia and total nitrogen content. Catalase tests should be made to determine the effectiveness of the vegetable blanching process. If important, color changes should be made with the aid of a Lovibond colorimeter or Munsell color discs. Bacteriological tests may include total bacteria, yeasts and molds and staphylococci.

Evaluating Packaging Materials

Various types of materials, such as plastics, adhesives and laminates, special boards and papers and water-resistant coatings, demand special consideration. Materials vary in degree of flexibility. Some are too stiff and do not lend themselves readily for packaging foods. Others tend to curl excessively. Rigid, water-tight containers are necessary for moist or liquid products.

The adaptability of sheets possessing low moisture-vapor transmission rates, to conform to product contour so as to provide close adherence to bone, fat and lean surfaces is one of the most significant functional properties of wrapping papers for meats. Despite the fact that recommended papers possess low moisture-vapor transmission rates, freezer burning and discoloration take place rapidly if sheets do not adhere closely to products. Where air pockets are present in a frozen, packed product, dehydration and oxidative changes occur. Meat packers are constantly seeking materials with high bursting strength and wet strength capable of resisting bone penetration.

Some products, such as luncheon meats, require paper possessing some degree of moisture-vapor penetration to allow for "breathing." Sliced luncheon meats, particularly, must not be packaged in papers with low moisture-vapor transmission rates, for considerable moisture will be retained and deposited on the surface of the product. Surface moisture tends to favor the growth of microorganisms.

Disadvantage of Some Materials

Packaging materials with blocking characteristics are undesirable, especially from a standpoint of operating cost. For example, if wrappers stick together, more than one may be picked up at a time during a hand-wrapping operation. Products may then be either wrapped with more than one wrapper, or time will be lost separating the wrappers each time they stick together. Similarly, wrappers may also stick to products. Sometimes portions of the wrapper, wax or other coatings may adhere to products when wrappers are stripped off. Laminated papers sometimes delaminate. Some materials are too brittle. Some are too thin. Others are too hygroscopic. And others lack greaseproofness. Pulping characteristics are found in some papers. Detectable odors in certain papers may be transferred to products.

Testing Closures

Closures must be adequately tested. Some products may attack a cap liner, break the seal, lose the vacuum and produce a nonsterile product. Other liners may impart objectionable odors to the food product. Bottles or jars may leak because the correct type of closure was not used or the cap did not fit the bottle properly. Solvents in flavor extracts may also attack liners and cause leakage. Glass bottles and jars should be inverted and

held in storage for a sufficient length of time to test the efficiency of caps, liners and gaskets against leakage.

Screening Tests

Screening tests must be made after all the packaging materials have been tested and the laboratory comes up with promising packages. Members of the packaging committee (or interested departments in smaller plants) are called in to select the one package that they prefer. Thorough consideration must be made for the appearance and the functional property of the packages during the screening tests. Cost of the materials must not influence selection at this point. While higher cost materials may extend product shelf-life, they may also lend themselves to less costly packaging operations. This may all add up to a cheaper unit package because of lower packaging costs, better consumer acceptance and less returnable merchandise.

Further tests must be made before new packages are released. Some laboratories repeat package tests to support their findings.

Test Shipments

Laboratory tests must be supplemented with actual field tests by making thorough shipping tests before adopting the package. The package should be shipped to different sections of the country in which it is to be marketed and held for a time corresponding to the guarantee period which has been established for the product.

Test shipments should be made either to the company's branch houses or warehouses. After arrangements have been made for the trial shipment, the laboratory should appoint someone qualified to follow the shipment. Unit packages and shipping containers must be examined upon receipt and after storage in the warehouse until product failure or termination of the guarantee period.

It is not always necessary for a laboratory representative to follow test shipments. Warehouses can be instructed to return the packages unopened to the laboratory for inspection.

Production Tests

If the new package holds up satisfactorily after the shipping test, production tests must be set up to determine: (1) The cost of the new packaging operation and (2) performance of the new package in the production line. Test costs should be made from production runs of a large quantity of samples. Cost analysis should also include materials handling costs. Often production difficulties will show up at this point. Sometimes it is too costly to correct these difficulties and an alternate package must be considered.

Before production tests are completed, the purchasing department, laboratory and supplier get together on cost of the material and specifications. Specifications will form the basis for cost evaluation in terms of the functional acceptability of competitive materials.

Consumer Acceptance Tests

If the experimental production works out satisfactorily, consumer acceptance tests are then made by the sales research department. For example, if new packages are being tested for limp perishables (fresh or frozen), it will be necessary to put up products in different size or style packages, with or without visibility. Tests must be conducted in service and self-service stores in communities with different income classes.

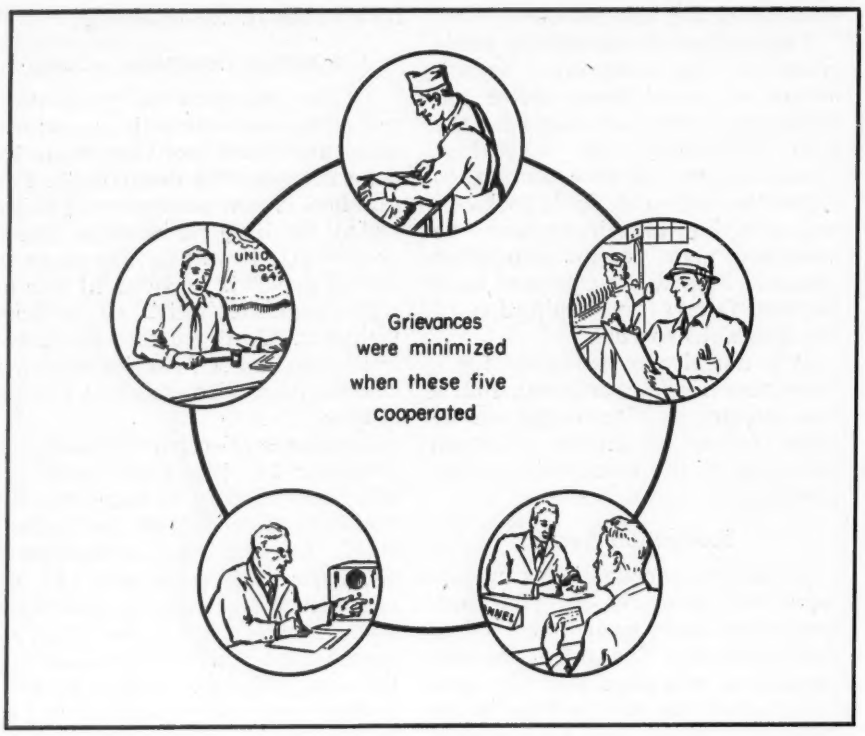
Consumer selection tests serve to evaluate: (1) Size preference, (2) whether visibility is required, (3) shelf-life of product on the dealer's shelf, (4) package performance, (5) color preferences, and (6) unexpected merchandising problems. Results obtained by the sales research department will indicate if the new package is acceptable or if further packaging research is necessary. These results will also form the basis for the development of a complete cost outline.

The new package is now ready for mass production. If a new product is to be packaged or a new packaging line must be set up, equipment manufacturers are consulted. The cost department makes cost estimates. Based on volume estimates, the engineering department makes provisions for adequate and economical layout of floor space. Equipment is then purchased for mass production of the various unit packages.

CHECK WEIGHING Armour Treet before the cans are automatically sealed and processed in huge retorts.

Armour & Co. photos

PACKAGING Armour Star bacon. Slabs of bacon are mechanically sliced, weighed and hand-wrapped in Cellophane.



"Tough Job" Articles

FOOD INDUSTRIES presents here the first of the prize winning articles on "Tough Jobs" around the food plant, submitted in the contest that closed on July 1. Richard B. Cribbs' article wins one of the $100 prizes. Other "Tough Job" stories will be published from time to time.—The Tough Job Editor.

Foremen Aided

Our production foremen have a tough job. We should make every effort to ease the pressure on them. In many instances the foremen can do a great deal to help themselves. Here is how our foremen worked out their own solution of their grievance problem.—Richard B. Cribbs.

Grievances Cut 99 Percent

A six-step grievance procedure, based on sound industrial relations practice,

By RICHARD B. CRIBBS
Personnel Manager
Gerber Products Company
Fremont, Michigan

MOST of us who are engaged in the direction of industrial relations activities, are realistic enough to believe that it is impossible to *completely* eliminate conflict from our day-to-day relations. Our over-all purpose, however, is to make every effort to minimize this conflict and to strive for increased cooperation throughout our respective organizations. Our methods of doing this are legion although they may vary from one plant to another. No single act or procedure can be guaranteed as a curative either—it is usually a combination of several well thought out technics. This is unalterably so because it is a generally accepted and proven fact that people are different and causes of conflict vary.

The writer, while attempting to adjust himself to a new work association, found himself involved in a rather serious conflict situation during the first half of last year. This situation was attacked as a specific problem. In the first six months we were getting an excessive number of grievances—as high as 15 in a single month; yet through our planned corrective efforts we were able to reduce this over the last half of the year to a total of four in that span of time—less than one a month.

The processing of these grievances made heavy, negative demands on the time of foremen, general foremen, superintendent, plant manager, personnel manager and others as required by our six-step grievances procedure. The time consumption was especially serious because we were failing to accomplish constructive gains in our employee relations, tensions were running high, foremen complained about not being backed up and the union seemed to find a fertile field for charges of discrimination and impartiality. What did we do about it?

Grievances Analyzed

Our first move was to make a thorough analysis of the grievances which were coming through. We learned that inconsistent interpretation and administration of our plant rules system was our big "bug-a-boo." There seemed to be a lack of knowledge regarding general rules, our foremen were inconsistent in applying penalties and some of the rules were outdated and practically impossible to administer.

Lack of effective methods of locating our "sore spots", before they festered into real trouble, was another major fault. This was true not only of disciplinary matters but of minor irritations g r o w i n g around daily job experiences.

The third problem, which was logically related to the other two, was identified as a rather definite gap in the relationships between foremen and stewards. This gap widened as our grievances multiplied.

The startling aspect of this analysis was the realization that we were definitely lax in simple fundamentals of sound employee relations. It was an especially dangerous situation because we were losing our foremen control through weaknesses in both our positive and negative forms of discipline.

We realized that negative discipline was the least desired type because it implied punishment of some kind for failure to conform. While it seldom did little to foster

By Commonsense Methods

reduced grievances from a high of 15 in one month to four in a half-year

good will it could, if properly applied, keep the troublesome individuals in line or, where absolutely necessary, it could provide just cause for dismissal. Since much of our trouble focused on our weaknesses in this area, we began our reorganization with an overhauling of our rules procedure.

Sitting down with our foremen group, we listed our shop rules in their entirety and tested their workability by asking these questions of each rule: 1. Is it simple and easily understood? 2. Is it fair and reasonable? 3. Can it be impartially enforced? 4. Will it apply to all employees? 5. Is it necessary? We found that we did have a few outdated rules which didn't hold up well under questioning. These we eliminated after consultation with top management.

Union Went Along

Using N.L.R.B. rulings and arbitration decisions as criteria, we asked ourselves questions aimed at determining the degree of penalty to be affixed, ie., 1. Which infractions are major and which are minor in nature? 2. Which ones should carry a warning, layoff, and discharge progression? 3. Should there be two warnings? 4. If we discharge directly, under what conditions could we do it? We finally worked out an acceptable and well tested scale — we felt reasonably certain that we would be on firm ground if all foremen followed the same procedure across the board.

Our next step was to sell the union. We got together with our bargaining committee and presented our plan. The stewards were fairly receptive because a few of the many cases had caused them considerable grief. When they realized that we had done a thorough overhauling job which was solidly founded on fairness and impartiality, they went along in a true bargaining vein. We agreed that we would not count any penalty over a year old toward discharge.

We launched the program by explaining it through our foremen and various employee educational media, such as the handbook, house organ, and bulletin boards. We had been using a discipline warning slip which was felt to be satisfactory for continued use. This slip was channeled through the personnel department where a designated individual was delegated to maintain a card file on each employee who had one or more slips. This provided the necessary record on which the foreman could base his proper action. No discharge was to be effected unless it cleared through the general foreman.

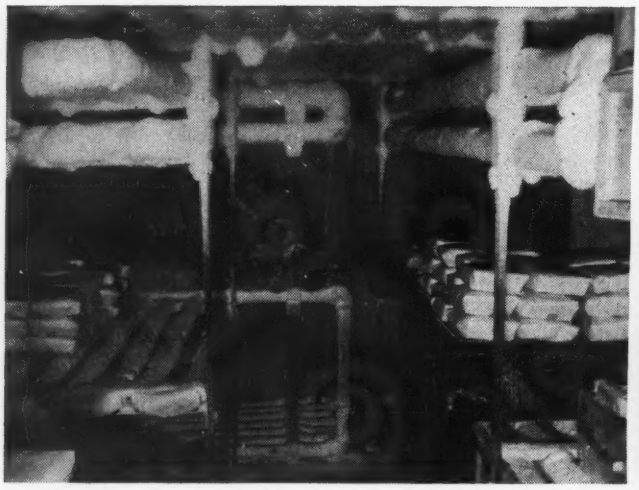
Preventive Program

The preventive phase of our plan was likewise fundamental in nature. Aiming our objectives at spotting little gripes and strengthening the daily contacts between foremen and employees, we agreed to do a more thorough job in the following ways:

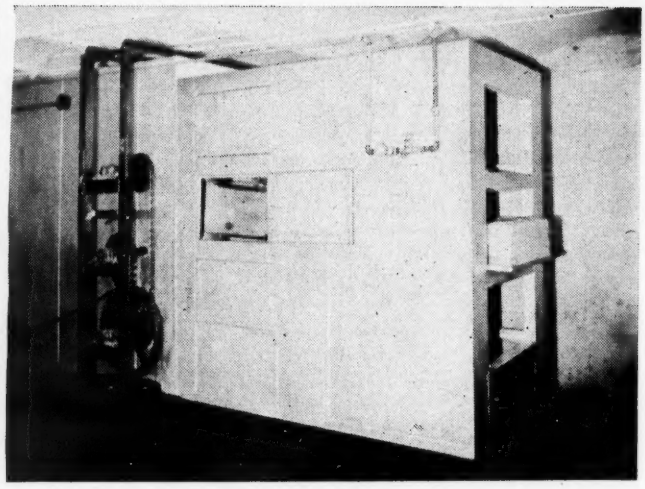
1. Improving effectiveness of our in-plant, follow-up, induction interview. We instructed our interviewer to look for the little complaints that seem to work their way into an honest, clear cut conversation about a man's job. Where possible, we attempted to sell the man on taking his gripe to his foreman. In any event, every gripe was followed up in some way or other.

2. Increasing the number of contacts between foremen and individual employees, including stewards. Through a few foremen meetings, we were able to convince our foremen that the employee's inclination to bring his minor com-

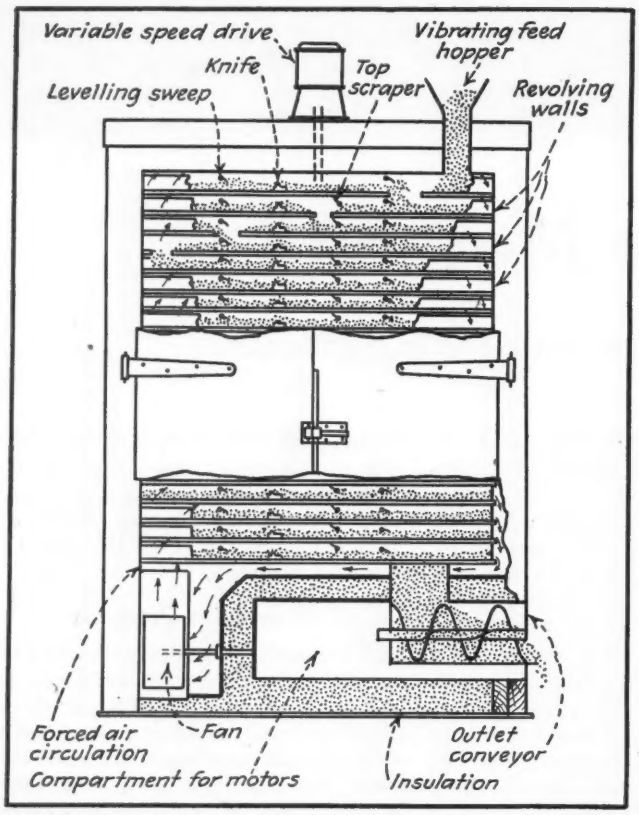
(*Continued on page* 198)



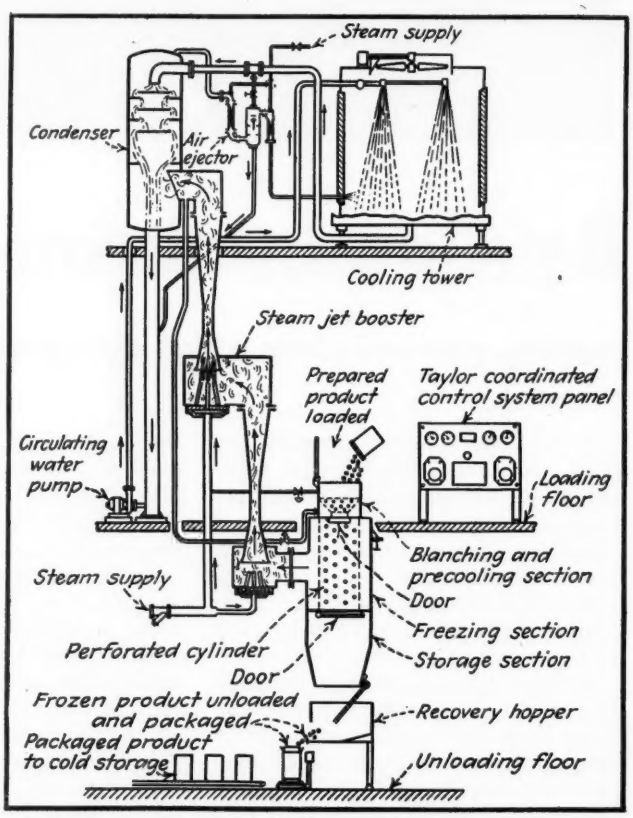
COLD Pack Room (meat packer style).



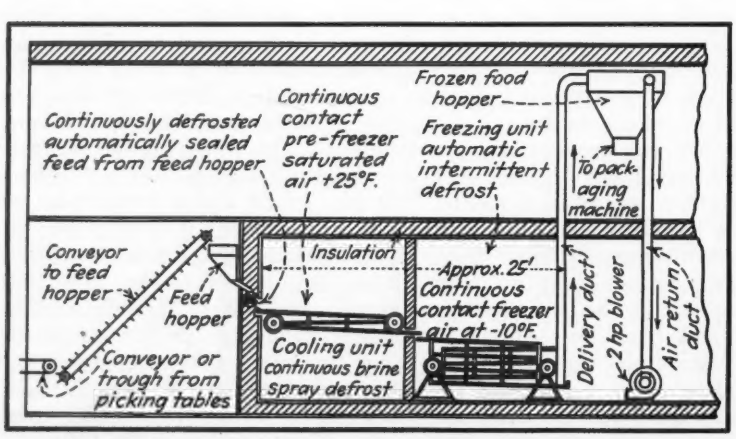
Z-FOG or Spray System. Known as "Z Process."



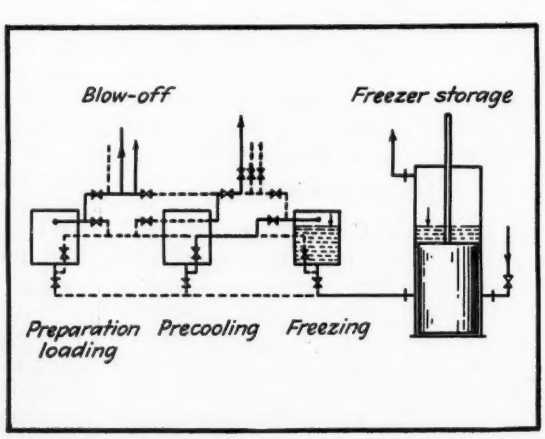
BIRDSEYE Gravity Froster for continuous freezing of loose products.



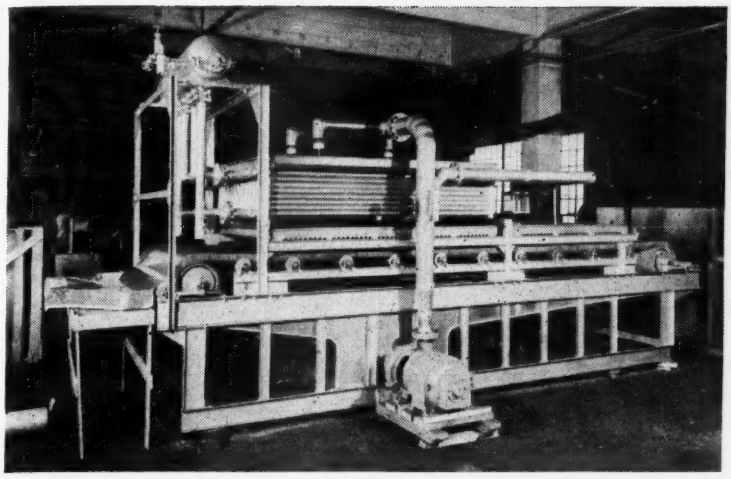
INGERSOLL-RAND Freeze-Vac. Freezing by flash evaporation.


Continuously defrosted automatically sealed feed from feed hopper
Continuous contact pre-freezer saturated air +25°F.
Frozen food hopper
Freezing unit automatic intermittent defrost
To packaging machine
Conveyor to feed hopper
Feed hopper
Insulation
Approx. 25' Continuous contact freezer air at -10°F.
Delivery duct
2 hp blower
Air return duct
Conveyor or trough from picking tables
Cooling unit continuous brine spray defrost

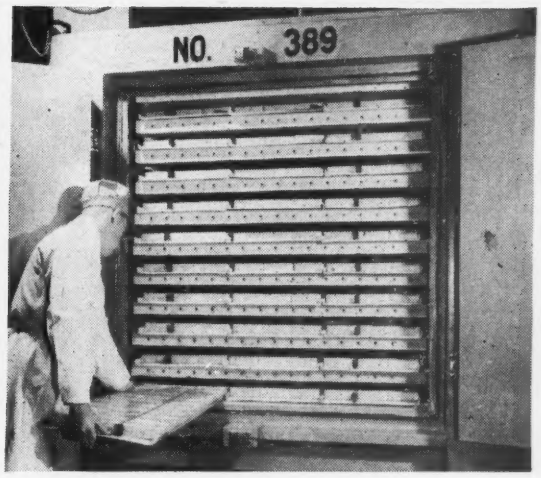
KNOWLES Shaker. Product in continuous contact with vibrating shelves.



NITROUS OXIDE Immersion System. (German.)



GILSON Immersion Type Quick Freezing Unit.



BIRDSEYE Multi-plate (Batch) System

Food Freezers Evaluated

Here is a round-up of the leading food freezing methods with information on their adaptability for any set of conditions. Processors can now use a performance yardstick in selecting equipment to fit their requirements

By GEORGE W. MEEK, Consulting Engineer, Syracuse, N. Y., and
VAN RENSSELAER H. GREENE, JR., New York City

FROZEN food packers are sometimes confused in their selection of food freezing equipment because of the variety of types available. While only three basic kinds of freezers are used, there are actually 22 types of freezing equipment. Consequently, a survey was made of all freezing equipment. This survey is intended as a general guide for processors considering installing new or replacing old equipment.

Before evaluating all the important food freezing technics, certain performance factors must be considered. To do this, it is important to: (1) List the leading food freezing technics and (2) discuss those factors which have the greatest bearing on the selection of the freezing system and will assure highest quality and lowest cost for a given set of conditions.

With the exception of nitrous oxide, all of the systems listed are basically American developments. Neither before nor during World War II were foreign nations active in creating other basically new freezing technics. Germany and Japan reproduced the Birdseye multi-plate machines in large quantity during the early part of the War when they had abundant supplies of aluminum. The nitrous oxide development program carried out in Germany is the only new foreign development during the last several years.

Food Freezing Systems

The more important types of freezing systems include:

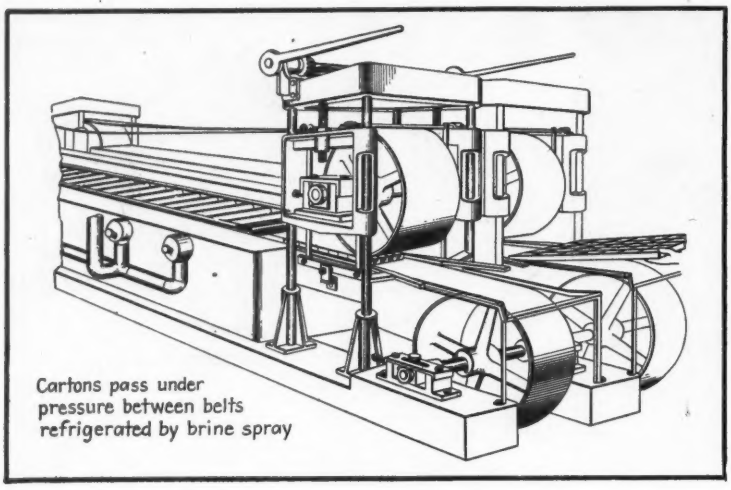
1. Cold pack room (meat packer style)
2. Z-fog
3. Gilson immersion
4. Birdseye multi-plate
5. Birdseye gravity froster
6. Ingersoll-Rand freeze-vac
7. Knowles shaker
8. Nitrous oxide immersion
9. Birdseye belt
10. Greene progressive
11. Salem tunnel
12. Finnegan tubular
13. Combination truck and conveyor
14. Z-rubber plate
15. Murphy—air and plate
16. York vertical
17. Finnegan multi-stage
18. Texas polyphase quick freezer
19. Frick blizzard
20. Conveyor tunnel
21. Slush freezer, pre-freezer concentrator and immersion after-freezer
22. Jackstone roto froster (now obsolete)

The illustrations, plus the accompanying discussion, serve to introduce all of the important freezing technics in use today. Fundamentally, as far as the refrigerating medium is concerned, there are only three basic kinds of freezers: (1) Immersion in liquid, gas or air; (2) plate or surface contact, and (3) vacuum or self-refrigerated.

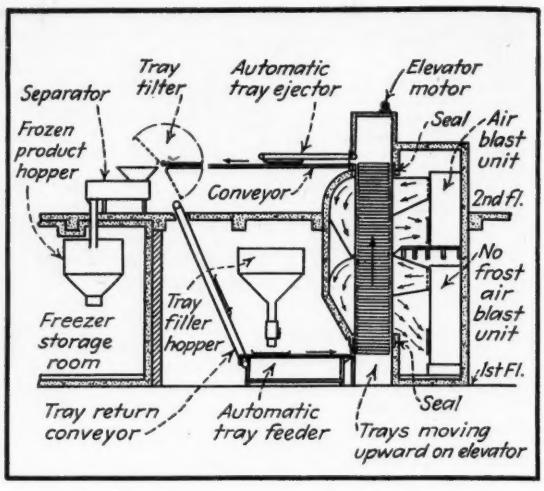
If each of the freezers mentioned is classified according to the freezing medium used (see Table I), it is apparent that the air or gas classification of freezing medium is by far the most common method employed. Actually, a more accurate measure of popularity is the tonnage of all types of products frozen in 1946 by each of the classifications. While actual tonnage figures are not available, it is probable that the relative percentages are about as follows:

60 percent—air—immersion
30 percent—plate—contact
5 percent—liquid—immersion
Less than 5 percent—fog, spray, moving plate and vacuum.

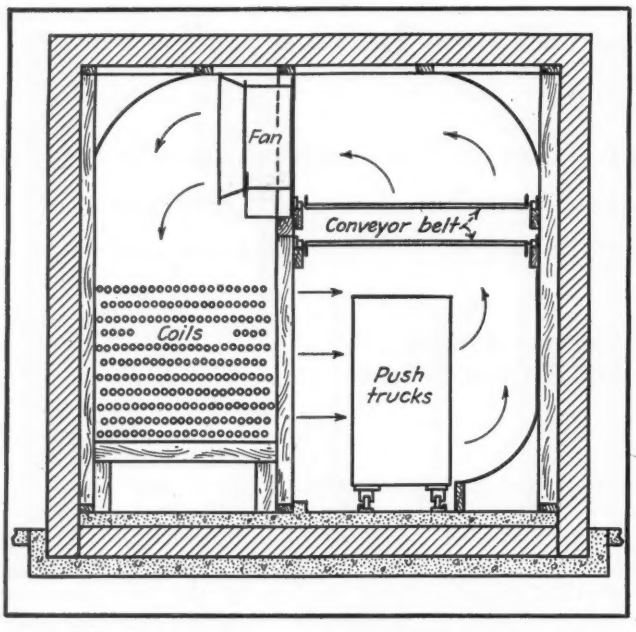
Does this present overwhelming use of "air" immersion mean that the "air" system is the one best system? Not at all. In fact, even



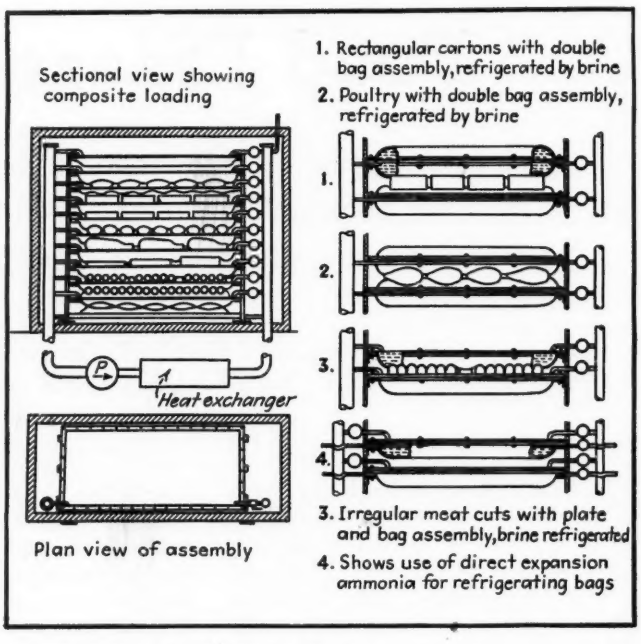
BIRDSEYE Double Belt Immersion Type Freezer.



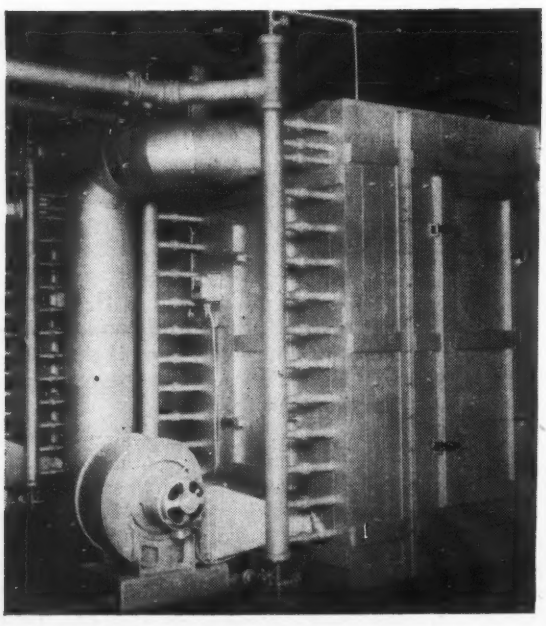
GREENE Progressive (Elevator) Type Quick Freezer.



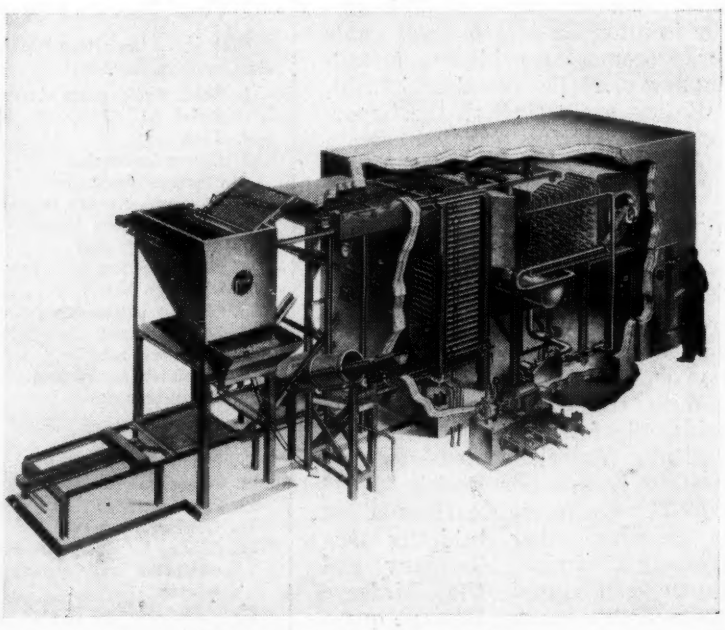
COMBINATION PUSH Truck and Conveyor Belt Freezing Unit.


Sectional view showing composite loading
Heat exchanger
Plan view of assembly
1. Rectangular cartons with double bag assembly, refrigerated by brine
2. Poultry with double bag assembly, refrigerated by brine
1.
2.
3.
4.
3. Irregular meat cuts with plate and bag assembly, brine refrigerated
4. Shows use of direct expansion ammonia for refrigerating bags

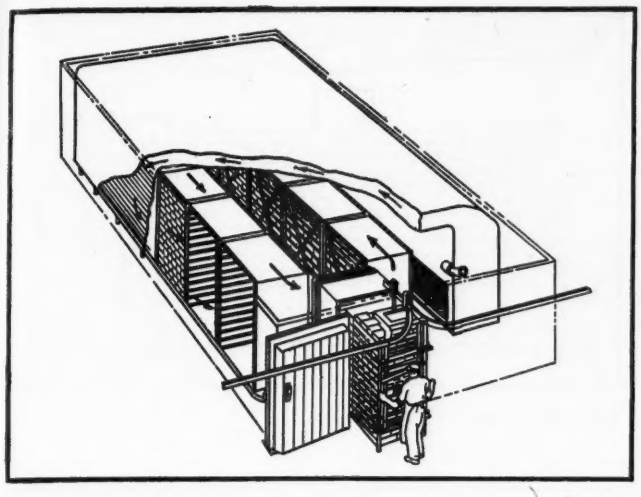
Z-RUBBER Plate Quick Freeze System.



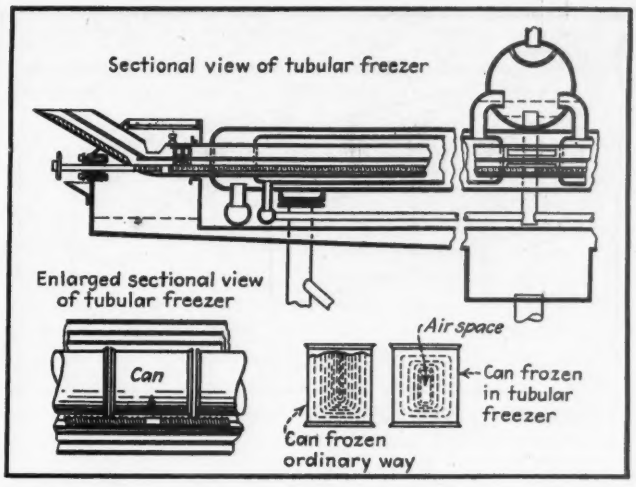
MURPHY Air and Plate Quick Freezing Unit.



YORK Continuous Vertical Fast Freezer. Air Blast Type.



SALEM Tunnel Type Quick Freeze Unit.



FINNEGAN Tubular or Pipe Freezer for freezing fruit juices.

our most accomplished crystal gazers will have difficulty in predicting the lineup in 10 to 15 years. Some of the complicating factors are:

1. Even though the Birdseye multi-plate system is a "batch" operation, a great upsurge in an interest in pressure plate freezing will probably result. This may be attributed to its great productivity per square foot and low maintenance costs, together with a recent expiration of the basic patents.

2. The recent increased interest in liquid immersion freezers, combined with the use of lower priced and improved tin cans, indicated that liquid immersion will increase greatly in popularity.

With the free-for-all which will take place between the proponents of air blast, pressure plate and liquid immersion type of freezers, let us list the factors which should be the basis for selecting the best system for any given set of conditions.

Performance Yardstick

In the main, the following factors determine the relative suitability of a "system." (Note that these factors are listed in the approximate order of their importance.)

1. Versatility for freezing
   a. loose material
   b. packaged material
   c. various sizes of packages
   d. variety of products
2. Materials handling costs
   a. batch
   b. continuous
3. Speed of freezing
4. Initial cost
5. Package
   a. cost
   b. shape retention
   c. consumer appeal (absence of limitations on)
6. Defrosting requirements
7. Operating costs
   a. power
   b. maintenance
8. Space requirements
   a. floor space
      1. width
      2. length
   b. head room

Versatility

Versatility is first in importance because it is an economic factor which is encountered in almost every food freezing plant. The very economics of the problem indicate that the plant should be in production for as many months out of the year as it is practical. While certain packers produce just one type and size of product, these are the exception rather than the rule. As integration of companies becomes more complex and competition more keen, many plants will, of necessity, be forced to freeze a variety of foods. Foods which will be frozen will include vegetables, fruits, seafoods, meat products and cooked foods.

This versatility requirement imposes a tremendous problem on the designer of the food freezing systems. The designer must correlate the economic factors that beset the packer. At the same time, he must design or select freezing equipment that will be the most satisfactory from the standpoint of a quality product and a system with low operating and materials handling costs.

It is possible that in the future it will become necessary to freeze large amounts of a specific item on a mass production basis. Then, and only then, will the need for versatility in food freezing systems decrease in importance below some of the other factors.

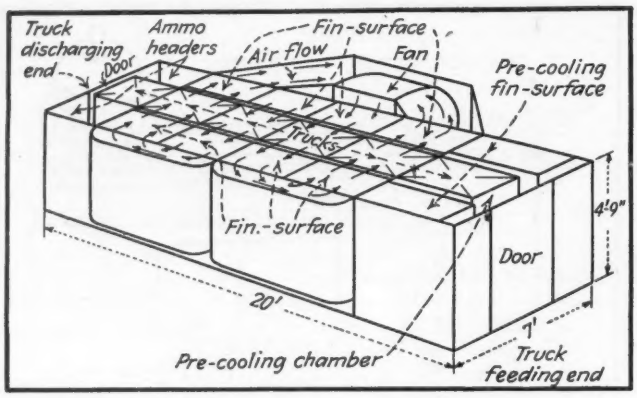
Materials Handling Costs

Similarly, materials handling cost is a factor which has become increasingly important. At present we rate it second in importance to versatility. Prewar labor wage rates were probably abnormally low in the food industry, but they have since been subjected to increases

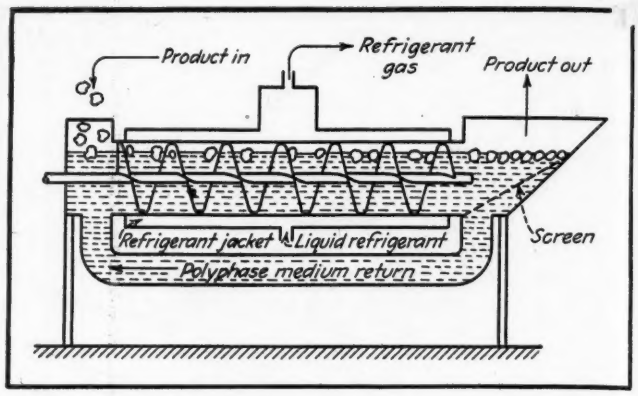
TABLE I—CLASSIFICATION of Freezing Systems on Basis of Refrigerating Medium.

Immersion			Plate (or surface) Contact		Vacuum
Air or Gas	Liquid	Fog, spray or cascade	Plate	Moving Surface	Self-refrigerated
Cold pack(1)*					
Murphy(15)			Murphy(15)		
Frick blizzard(19)	Texas polyphase(18)	Birdseye belt(9)		Birdseye belt(9)	Ingersoll-Rand freeze-vac(6)
Conveyor tunnel(20)	Finnegan tubular(12)	Gilson cascade(3)	Birdseye multi-plate(4)	Birdseye gravity froster(5)	
Finnegan multi-stage(17)		Z-fog(2)	Z-rubber plate(14)		
Greene progressive(10)					
York vertical(16)					
Knowles shaker(7)			Jackstone wheel(22)		
Salem tunnel(11)					
Nitrous oxide immersion(8)	Nitrous oxide immersion(8)				

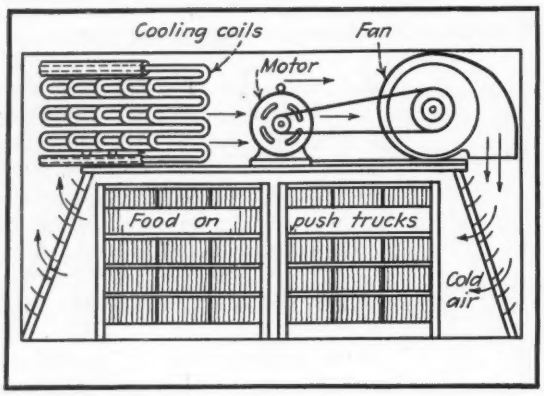
*Numbers refer to food freezing systems chart on page 93.



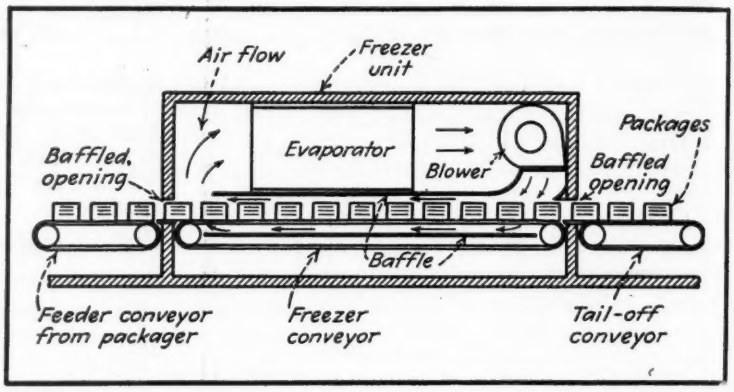
FINNEGAN Air Blast Multi-Stage Freezer.



TEXAS Polyphase Quick Freezer.



FRICK Blizzard Freezer (temp. as low as —80 deg. F.).



AIR BLAST Conveyor Tunnel Freezer.

which are probably even greater than in other industries. Thus, in today's production picture, labor costs in a food processing plant have become of paramount importance.

Opportunities exist for designers to develop food freezing equipment and methods that will substantially reduce the amount of labor required to handle products through the food freezing system.

Batch or Continuous

Materials handling through the freezer system today is, generally speaking, of either the "batch" or the "continuous" type. In a batch operation, the freezer is loaded to capacity with food to be frozen all at one time, or as near to that as is practical. When the food is frozen, the batch is removed and another batch is put in. Continuous freezing is, as the name implies, a process whereby food is continually entering the freezer and being discharged from it while the food freezing is in operation. Undoubtedly, the trend will be more and more in the direction of the continuous process.

The importance of the speed of freezing a product is recognized. Yet, some may be surprised at rating the speed of freezing a product third in importance to versatility and materials handling costs.

Any of the systems previously outlined can be designed and operated to freeze sufficiently fast to give a good quality product. Variations in quality, caused by not grading raw materials, however, are far greater than the variations in quality due to the rate of freezing.

Any of the liquid immersion systems outlined, if used with a –30 deg. F. liquid, will give a high freezing rate, even with gallon size containers. Similarly, any air blast system using air at –10 deg. F. or below, with velocities at least 500 ft. per min. leaving the product, will give entirely adequate freezing speeds. In the case of plate freezers, it is assumed that the refrigerant will be at least –20 deg. F. If these conditions are carried out and freezing conducted in accordance with the designers' specifications, a sufficiently high quality product will result insofar as freezing speeds are concerned.

Initial Cost

The initial cost is often regarded as being of more importance than is warranted. Equipment can be used for at least ten years, producing millions of pounds of frozen food annually. Consequently, several hundred or several thousand dollars difference in the initial cost between two types of systems may be offset many times over by savings in labor, power or package costs.

Packaging

Two important aspects to consider in evaluating freezing technics are: (1) The effect of frozen food packaging on the freezing system and (2) the effect of the freezing system on the packaging requirements.

Factors involved in loose freezing are a good example. Loose freezing is considered an excellent method of freezing foods, superior in some respects to packaged freezing. Loose freezing, however, has an inherent difficulty. It involves packaging of foods after freezing. This is satisfactory with some items, such as peas and lima beans, but with others it does not work out so well. As a result, most of the loose freezing systems are also designed to freeze packaged products. Table I shows that this almost automatically brings the classification of the freezing method into the air or gas freezing classification.

A particular application of the packaging factor as related to the freezing system is in the use of immersion freezing. Immersion freez-

ing is undoubtedly one of the most economical methods of freezing both in initial and in operating costs. Brine and sugar solutions, the common secondary refrigerants used in immersion freezing, have serious disadvantages. Sugar sirups are extremely viscous and difficult to handle at low temperatures. Their application is also limited to a relatively few products. On the other hand, under actual operating conditions, brine will almost always penetrate into the product being frozen, unless difficult and expensive precautions are continually observed. If a sealed metal container is used to prevent the penetration of brine into the product, immersion freezing becomes a highly desirable method of freezing. The major factor limiting the use of metal cans for frozen foods has been the question of public acceptance.

In special cases the package exerts a great influence on the freezing system, or vice versa. For example, the Finnegan tubular freezer is designed for freezing only cylindrical cans or glass jars. These special cases are relatively few, however, and represent only a small proportion of the total food frozen in a packing season.

Defrosting Requirements

Extensive defrosting operations are a definite obstacle to efficient and economical operation. For this reason, it is desirable to minimize defrosting operations in food freezing systems and freezer storage rooms.

These operations are usually more troublesome in air blast than in plate or immersion freezing systems. The reason for this is that the cold air picks up moisture and some of this moisture is deposited on the coils as frost. With finned coils, frost deposition closes off the air passages and reduces the capacity of the equipment to do an effective heat transfer job. With either the plate or immersion freezers, there are no exposed coils that can pick up moisture from the air to form frost on the coils.

One of the methods devised to limit frost formation on air cooling coils is to continually pass a low freezing point liquid, such as brine, over the coils. This liquid picks up the moisture deposited on the coils, carries it away and prevents it from forming on the coils as frost. With plate, immersion and air blast freezers which use a frost preventing system, delays during the freezing operation are minimized and economy and operating efficiency are increased.

Operating Cost

Operating costs, in this discussion, refer to power costs required to operate a food freezing system. In this respect, it is amazing what a small percentage of the total cost

(*Continued on page* 206)

TABLE II—RELATIVE PERFORMANCE OF FROZEN FOOD SYSTEMS.

(For Rating Scale (A-D)* and Special Notes (1-10),** see below.)

Performance factors	Versatility in freezing				Materials handling methods		Speed of freezing	Initial cost	Effect on package		Ease of defrosting	Operating costs		Space Requirements	
Name of system	Loose products	Packaged	Various size packages	Variety of products	Batch	Continuous			Cost	Shape retention		Power	Maintenance	Floor space	Head room
Immersion—															
Air or gas															
Cold pack room	C	A	A	A	x		C	See	7	C-D	B-C	3rd[10]	A	A	A
Murphy (improved)	A	A	1	B	x		A		7	C-6	B-C	3rd	A	A	A
Frick blizzard	A	A	A	A	Combination		A	Note	7	C-6	B-C	3rd	B	A	A
Conveyor tunnel	A	A	A	A		x	A		7	C-6	B	3rd	B	A	A
Finnegan multi-stage	A	A	A	A	Combination		A	5	7	C-6	B	3rd	B	A	A
Greene progressive	A	A	1	A		x	A		7	C-6	A	3rd	B	A	C
York vertical	A	A	1	A		x	A		7	C-6	B-C	3rd	B	A	C
Knowles shaker	A	C	C	C		x	A		7	C-6	B	3rd	B	A	C-D
Salem tunnel	A	A	A	A	Combination		A		7	C-6	B	3rd	B	A	A
Liquid															
Texas polyphase	2	C	D	2		x	AA		...	D	9	1st	C	A	A
Finnegan tubular	D	A	A	A		x	AA		8	A	A	1st	A	A	A
Nitrous oxide immersion	C-B	B	B	4	x		AA		...	C	A	1st	C	B	A
Fog or spray															
Birdseye belt	D	A	1	3		x	A		A	A	A	1st	B-C	B-C	A
Gilson cascade	2	C	D	2		x	AA		...	D	9	1st	B-C	B-C	A
Z-fog	D	A	A	B		x	A		A	C	A	1st	B-C	B-C	A
Plate—															
Plate															
Birdseye multi-plate	D	A	1	B	x		A		A	A	A-B	2nd	A	AA	A
Z-rubber plate	D	A	B	3	x		A		A	A	A-B	2nd	A	A	A
Roto-froster	D	A	C	3		x	A		A	A	A-B	2nd	C	AA	A
Moving surface															
Birdseye belt	D	A	1	3		x	A		A	A	A	2nd	B-C	B-C	A
Birdseye gravity froster	C	D	D	3		x	AA		D	D	A-B	2nd	C	AA	A
Vacuum—															
Self-refrigerated															
Freeze-vac	C	D	D	4	Combination		AA		B	D	A	?	C	B	C

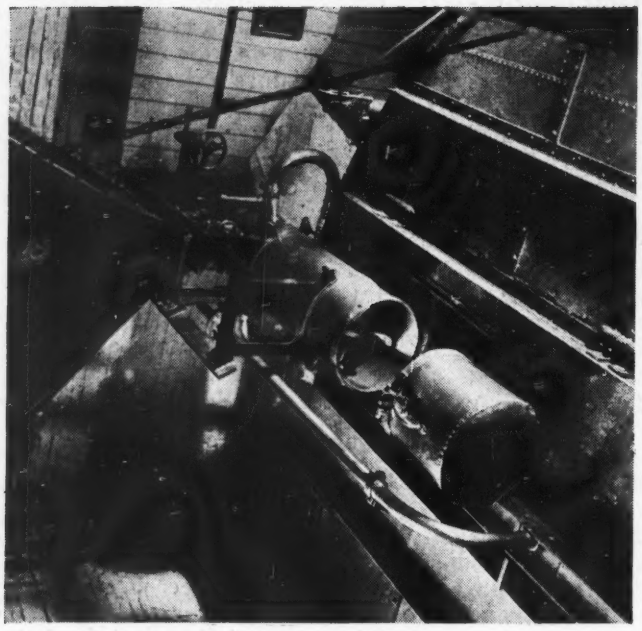
***Rating Scale**

A—excellent
B—satisfactory
C—possess limitations or certain undesirable features
D—not applicable, or unsatisfactory

****Special Notes**

1. Size normally limited to retail and smaller institutions.
2. Only a limited variety of fruits, berries and vegetables may be frozen, due to problems of selecting a suitable liquid which will not adversely affect taste, color, or flavor of products.
3. Could handle only a limited variety. This system included for historical significance only, since no systems of this type are in use today.
4. This system is so new that little practical experience has been obtained. It appears to be suitable for only a small variety of products.
5. Recent wartime and postwar fluctuations in material and labor prices make any exact comparisons impractical. While the refrigerating equipment (coils, fans and compressors) for air blast cost less than the refrigerating equipment for immersion and plate systems, the cost of insulated chambers is generally so much more for air blast than for other systems that no big overall price advantages are possessed by any one system.
6. As ordinarily used, the sides of the retail packages bulge to an objectionable degree. It is possible to devise aluminum contact and spacer plates to minimize this problem.
7. Almost all of the air blast systems allow great latitude in choice of package designs and materials. No one air blast system seems to possess any marked advantages over any other air blast system in this respect.
8. Most immersion systems which immerse the "packaged" product necessitate the use of metal or glass packages at a somewhat higher cost than for flexible materials most commonly used with air blast.
9. This system allows some of the moisture from the product to dilute the liquid used for freezing. This requires installation of equipment which will either periodically or intermittently "re-concentrate" or evaporate the water out of the freezing solution.
10. Rating here is in approximate order of desirability:
    1st: lowest power cost
    2nd: next lowest power cost
    3rd: highest power cost

The rating on air blast is poor because of fan horsepower, slower freezing, and lower refrigerant temperatures.



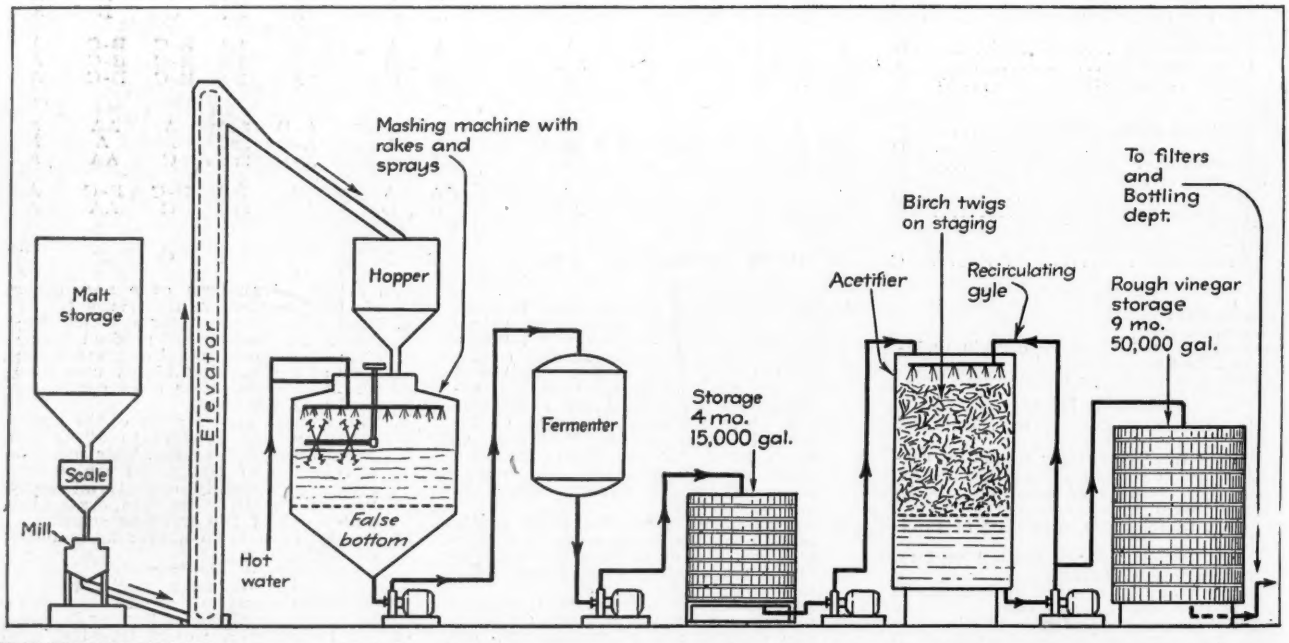
1. VINEGAR making starts at the hopper and mashing machine, where the ground barley malt is mashed with hot water at controlled temperatures. It is then shot into the mashtun.

2. HERE the mash is churned with rakes and sprayed with hot water. Diastatic action produces maltose, chief constituent of the wort. Wort is drained off and pumped to the fermenters.

Vinegar in Britain

This picture story of vinegar making in England carries you from the treatment of the prepared malt to the finished product in a process that retains ancient methods while fully utilizing modern developments

Central Feature News Photos



THIS FLOW-SHEET follows long established methods in the ancient process of making vinegar from barley malt as practised in England.

3. THE WORT is now pitched with yeast and rapidly ferments. The result, a rough beer, is called gyle. No filtering or sterilization is required, as acid-forming bacteria are desirable.

4. FROM THE FERMENTER, the gyle is pumped into these storage vats, where it remains for three to four months, while the dead yeast settles out. It is then pumped into the acetifiers.

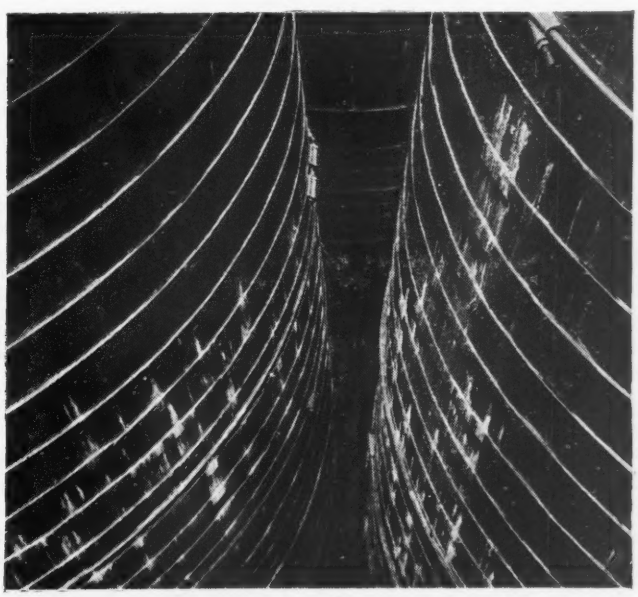
THERE are few better examples of combining ancient methods with modern scientific progress than in the malt vinegar industry in the British Isles. The industry traces back beyond the 17th century. It was during the 17th, 18th and 19th centuries, however, that flavoring of vinegar grew. This was the period when the stillroom was the household factory. Here pickles, sauces and condiments were prepared and preserves put down for winter.

It was in the stillroom, too, that the English learned to add cowslips, rosepetals, violets, gillieflowers and elderflowers to their vinegar. A beverage was also concocted with vinegar as a base, adding such fruits as raspberries and black currants, sweetened with honey and mixed with water. For stronger tastes, tarragon, mint, horseradish, eschallot, garlic and chili gave piquancy to the vinegars used in cooking and pickling. Sauces such as Worcestershire and Yorkshire are actually highly spiced malt vinegars and recipes for them appear in the 18th century cook books under the name "camp vinegar."

In joining the old with the new, a plant's cellar might reveal a stone-flagged floor, laid 200 years ago, and oak vats that are close to 100 years old. On the next floor will be a modern bottling plant, with its shining, automatic machinery.

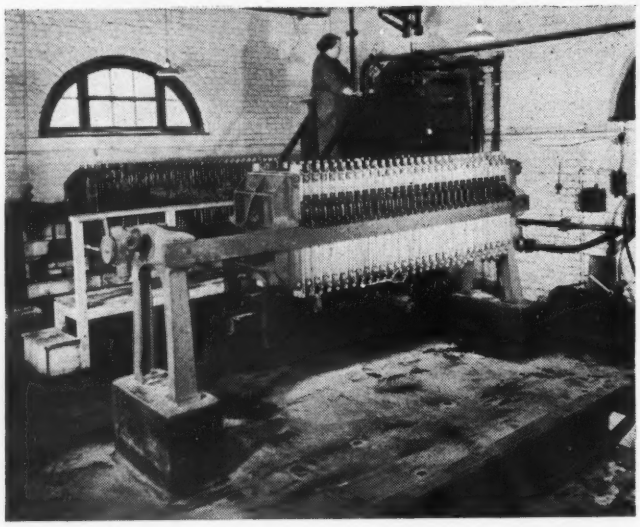
Production of this full bodied vinegar actually begins on the barley fields of Norfolk, Suffolk and Scotland. Few vinegar brewers malt their own barley. Demanding a high extraction of 93 to 94 percent and a diastase of 60 to 80 deg., the brewers rely on the expert maltster. The malt is coarse ground in a mill, where steel rollers have largely replaced stones. From the mill the ground malt is conveyed to the hopper and mashing machine, where the story depicted on these pages begins.

5. THE TOP two-thirds of these acetifiers are layered with birch twigs. Over these the gyle is constantly pumped, while temperature and air intake are carefully watched.

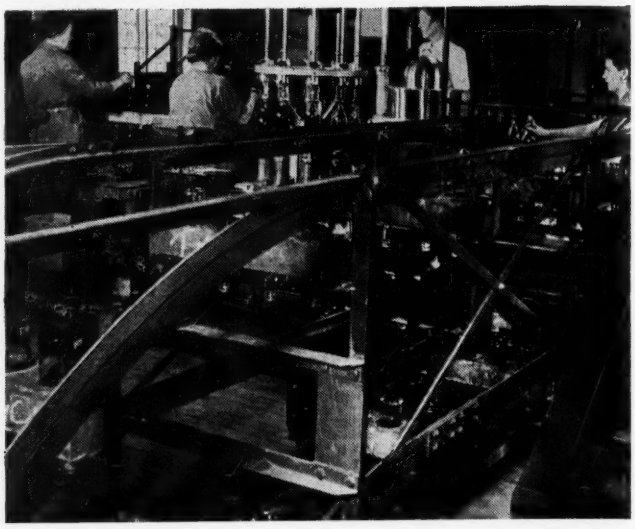


6. REACHING the rough vinegar stage in six days, the liquid is ready for storage, where modern science gives way to the old time vats of 50,000 gal. capacity. Here it is left to mature.

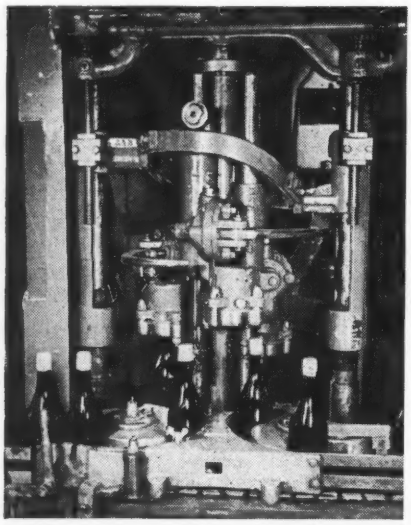
The Acetifiers Are a Prime Example of Combining Old and New



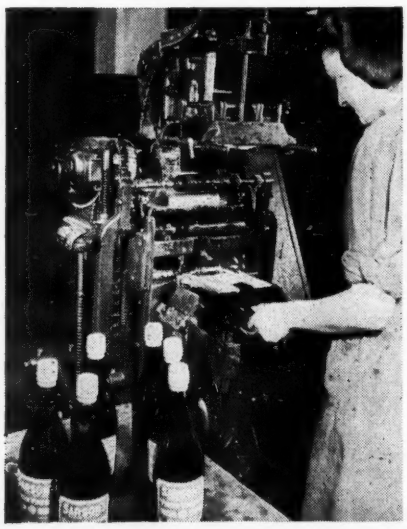
7. HAVING PASSED through the lengthy maturing period, where secondary and tertiary fermentations take place, the vinegar is passed through the filtering presses.



8. AFTER THE VINEGAR is filtered, it is pumped to the bottling shop and piped to an overhead supply tank, from which it is fed into the bottles. They are then capped as seen at left.



9. FILLED AND CAPSULED, the bottled vinegar has completed a process that takes from 12 to 18 months from the time the barley was harvested. The bottle is now ready for its final handling.



10. LABELING AND CASING complete the job of turning out the malt vinegar that is sought after in England as a base for the popular British pickles and sauces with their rich bouquet and flavors.

British Processing

DEVELOPMENTS in food processing, equipment, methods and standards, throughout the British Empire, have continued at a healthy pace since the close of the war. An improvement is noted, for example, in the extraction and preparation of agar-agar from native seaweeds on the British coasts and elsewhere. An aqueous extract is obtained by boiling the seaweed in a weak calcium hydroxide solution, separating the resulting liquor, and subjecting this to heat and pressure in an autoclave in the presence of potassium hydroxide. The extract is changed into agar by neutralizing the solution with hydrochloric acid, decolorizing the neutral liquid with charcoal and then filtering the resulting concentrated product.

Food yeast used with molasses is getting into full scale production in a plant built with government funds at Frome, Jamaica. In the process, molasses is mixed in solution with water and passed through heated coils to bring to the boiling point. This boiling wort solution is then mixed with superphosphate in a tank. While still hot, the mixture is neutralized with sodium hydroxide or soda ash, which produces a heavy precipitate. Cooled to 30 deg. C., it is fermented with yeast. In the next stage, the wort is separated, dried and pounded into powder weighing 30 lb. per cu. ft. and packed in 100-lb. jute bags lined with moistureproof asphalt paper, or in 28-lb. tins.

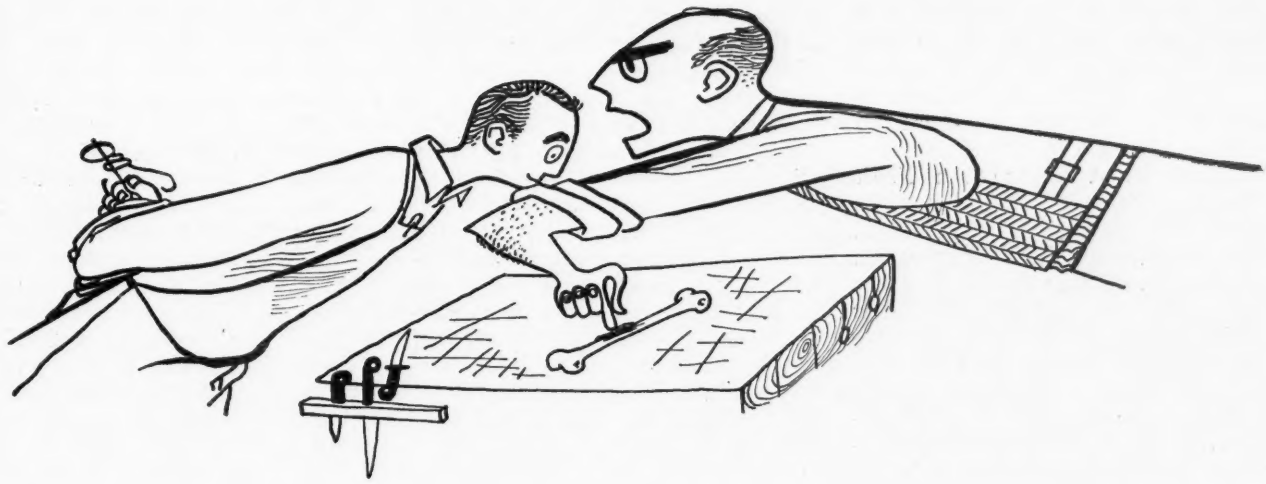
Developments in Ireland

In Ireland, the keeping quality of bread and confections is enhanced by distributing a small quantity of mineral, vegetable or animal wax throughout the flour or dough. This wax is mixed under heat with pharmaceutical paraffin oil, animal or vegetable oils, fats, glycerin or lecithin. Flour is added when the temperature is reduced below 212 deg. F. The result is then cooled and reduced to a powder. For 10,000 parts of flour, the requirements for this mixture are 28 parts paraffin or vegetable oils, 56 parts paraffin or beeswax, 2 parts margarine and 269 parts bread flour.

A process for manufacturing table jelly and marmalade from seaweed has also been developed in Ireland. The seaweed is dried and washed with citrus fruit for 24 to 100 hours in order to convert the seaweed into a semi-gelatinous form. Sugar and pulped and sweetened citrus fruit are then added.

British canners have sent representatives to South Africa with the idea of establishing plants to can fruit solely for export to England, in an effort to overcome shortages of these items. These canned fruits will have to compete in price with those from the U. S.

Excerpts from a British Empire summary by Eric Hardy, food consultant, Liverpool, England.



The Courts Say It's The Law

These recent higher court decisions are of immediate concern to food plant operators. They may help other operators to avoid similar suits or aid in the preparation of a winning defense if someone does sue

By LEO T. PARKER, Attorney at Law, Cincinnati, Ohio

POINTS of law that may arise to plague the food processor are by no means confined to any one category. Some of the more recent higher court decisions, cited here, cover widely divergent issues. Considerable discussion, for instance, has arisen from time to time over the legal question: When are employees exempt from the Fair Labor Standards Act? The answer is: When such employees perform contract work, *not* under control of the employer.

For illustration, in *Walling v. Rutherford Food Corp.*, 156 Fed. (2d) 513, it was shown that a company owns a slaughterhouse plant. It needed beef to manufacture canned chili. It furnished a room for workers and paid boners 45 cents per 100 lb. of boneless beef. The employment contract stated that the employees should perform the work as independent contractors.

The court decided that these boners are legal employees within scope of the Fair Labor Standards Act. The testimony showed that the company's manager would observe the work and complain if the boners left too much meat on the bones. Thus, the company's manager had "control" over the employees. This court said:

"These underlying economic realities, considered in their composite effect, lead to the conclusion that the boners were and are employees within the meaning of the Act."

Tea Patent Valid—In Barnett, 155 Fed. (2d) 540, the Court of Customs and Patent Appeals held a tea bag patent valid. This patent was on a filter sheet with a seam joint having a dependent elongated handle. The handle is for manipulating the package during brewing of the tea.

Trade-Mark Confusion—In *Vital Foods Corp. v. Miles Laboratories, Inc.*, 156 Fed. (2d) 77, the Court of Customs and Patent Appeals refused registration of the word "Vita-Might" as a trademark, for use on a concentrate of essential vitamins and minerals, in view of confusion that would result because of prior registration and use of the term "Vitamiles" for vitamin tablets.

Similar Marks—In *LaTouraine Coffee Co., Inc., v. Lorraine Coffee Co., Inc.*, 157 Fed. (2d) 115, the higher court held that the word "Lorraine" is so similar to the registered trademark "LaTouraine," applied to coffees, as to cause confusion among reasonably careful purchasers, and may constitute an infringement. This court said:

"Defendants have attempted to distinguish 'Lorraine' from 'LaTouraine' on the basis of the number of letters and syllables in the words, but this form of technical gymnastics is not determinative."

Must Report Accident—In *Csont v. Standard Brands*, 48 Atl. (2d) 573, the higher court held that an employee is not entitled to compensation for inguinal hernia caused by sudden effort or severe strain, in absence of preponderate proof that he noticed severity of situation and communicated it to employer within 24 hours after the alleged accident.

Statute of Limitation—In *Dowling v. Lester*, 39 S. E. (2d) 576, it was shown that a state law provides that suits for injuries to the person shall be brought within two years "after the right of action accrues."

A consumer was injured at about 2 p.m. on Feb. 19, 1944, when she bit a rock in food. She sued to recover damages therefor at about 9 a.m. on Feb. 19, 1946.

The higher court refused to allow the case to be tried on the grounds that the suit brought on Feb. 19, 1946, seeking to recover damages for injuries sustained on Feb. 19, 1944, is barred by the statute of limitations.

Oral Contract Contradicts—All

oral agreements are merged in a subscription contract, which has been reduced to writing and signed, and parol evidence is not admissible to vary the legal import of the written contract.

In *Mapes v. Santa Cruz Fruit Packing Corp.*, 173 Pac. (2d) 182, a seller sued Santa Cruz and alleged that he delivered to the corporation 246,312 lb. of strawberries, of the reasonable value of $36,946.80, for which he was paid $29,557.44, leaving a balance of $7,389.36 due and unpaid. The corporation proved that the strawberries were sold under a written contract which provided that the price was to be 12 cents per pound for the season.

The seller attempted to testify that there was an oral agreement that if the Office of Price Administration would not limit the price to 12 cents a pound, the written contract would not be effective, and the corporation would pay the seller as much as would be paid by any other company in the area. The higher court refused to listen to this oral agreement and held the corporation not liable for further payment, saying:

"In the final analysis, the question always resolves itself down to this: Does the parol testimony actually vary or change the terms of a written contract. If it does, it is not admissible."

Jury Must Decide — Modern higher courts consistently held that in all suits by purchasers of harmful food products, the jury may decide whether the manufacturer's negligence resulted in injury to a purchaser or consumer.

For example, in *Holley v. Purity Baking Co.*, 37 S. E. (2d) 729, it was shown that a baking company, through a distributor, caused a cake wrapped in Cellophane to be sold in the original package, which cake contained a piece of wire, resulting in injury to the consumer. The latter sued the baking company for damages.

The higher court held that since the testimony proved that the baking company used reasonable care in the manufacture of its products, there is *no presumption* of negligence on the part of the baking company; but the jury may infer that the consumer's injury either did or did not result from negligence of the baking company. Obviously, if the jury decides that the baking company's employees were negligent, the company is liable in damages to the consumer.

This court also held that if a wrapper has been broken before the package is delivered to the consumer, the jury may assume that the manufacturer was not negligent, and therefore not liable in damages to the consumer.

License Refused—In *Camp v. Director of Agriculture*, 170 Pac. (2d) 702, it was shown that the Director of Agriculture decided that applicant for a license, as a processor of farm products, had violated the Agricultural Code by operating as a processor, or processor's agent, without having first obtained a license.

The higher court refused to grant the applicant any license in view of these past violations.

Negligence Not Assumed—In *Washington Food, Inc., v. S. M. Spencer Mfg. Co., Inc.*, 67 N. E. (2d) 664, it was shown that the occupant of a second floor had a five gallon carboy of ink, and during the night the carboy broke, permitting ink to seep to the first floor, damaging stored food products. The higher court refused to hold the second floor tenant liable in damages because the food manufacturer failed to prove that the ink leaked as a result of the former's negligence.

No Bearing—In *Albert Albek, Inc., v. Brock*, 170 Pac. (2d) 508, it was shown that the Director of Agriculture denied an application for a processor's license to handle and process farm products and without affording the applicant the formality of a hearing.

The higher court held that the Director had acted illegally and arbitrarily.

Patent Allowed—In Freeman, 154 Fed. (2d) 159, the Federal Court allowed a patent on a tubular casing, made of a long strip of paper having edges extending forming a rib, which is useful for removing the casing. This casing is used for food products such as various types of sausages.

Employees Fight — Generally speaking, an employer is not liable for injuries sustained by employees who fight each other.

For illustration, in *Carr v. Crowell*, 166 Pac. (2d) 371, it was shown that an employee named Enloe got into a fight with another employee and hit him with a hammer. The injured employee sued his employer for damages, but the higher court refused to hold the employer liable, saying:

"Was Enloe engaged in the scope of his employment when he threw the hammer at plaintiff? This question must be answered in the negative. Enloe was not hired to throw hammers."

No Compensation—In *Gross v. Great Atlantic & Pacific Tea Co.*, 25 So. (2d) 837, the testimony showed that one employee asked another employee why he didn't admit eating the stolen sardines. A fight ensued and one of the employees was seriously injured. The higher court refused to allow this employee compensation under the State Workmen's Compensation Act, saying that the injury did not "arise out of employment" within meaning of Compensation Act.

Gross Negligence—A paid bailee, as a warehouseman, is legally obligated to use ordinary care to safeguard stored merchandise.

In *W. T. Cowan, Inc., v. Wagshal*, 47 Atl. (2d) 94, it was shown that a food distributor ordered five cases of canned hams shipped to him from New York City in a truck. The shipment was labeled "Perishable —canned meat—must be kept refrigerated."

Due to miscarriage the merchandise was stored in a warehouse and later reshipped. The hams were finally delivered, but in a damaged and completely worthless condition.

The higher court held the carrier fully liable, saying:

"Despite the labels, which gave plain warning that the merchandise was canned meat and perishable and must be kept refrigerated . . . we think this circumstance would have supported a charge of gross negligence."

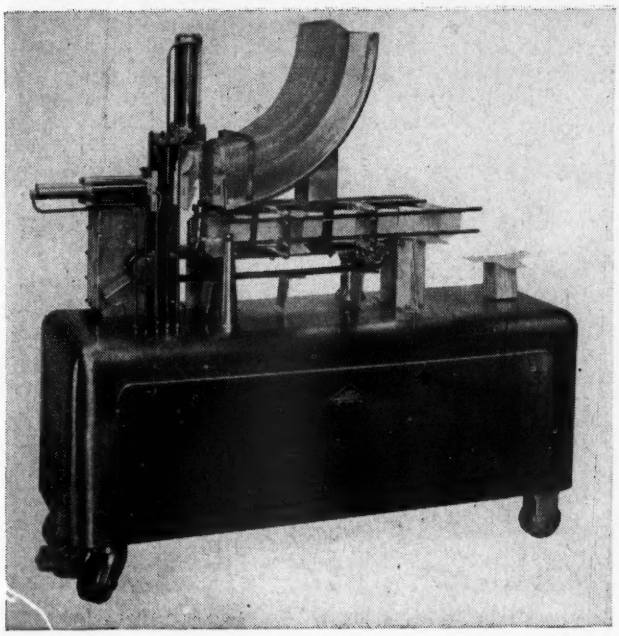
Sewer Is Overloaded—Any user of a sewer who overloads it, or violates valid laws, ordinances, or regulations, may be personally liable for pollution of water to detriment of the owners of private property.

For illustration, in *Klassen v. Central Kansas Cooperative Creamery Association*, 165 Pac. (2d) 601, it was shown that a creamery company permitted harmful waste products of its plant to escape and injure a farm owner by polluting a stream and underground water supply. The farm owner sued the creamery company for damages.

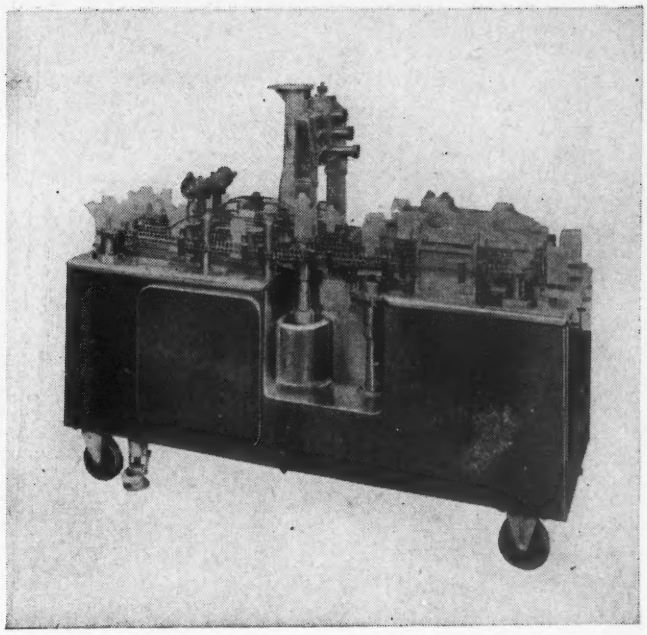
During the trial, testimony was given as follows: The city operated a sewage disposal plant just north of a farm. This city disposal plant drained into a small creek, which flowed through a part of the farm about 300 ft. from the house.

Further testimony showed that a creamery plant in the city dumped about 15,000 gal. of creamery waste a day into the sewer system, which overloaded the sewage plant, causing increased bio-chemical oxygen demand content of the effluent of the plant far beyond the average domestic sewage.

(*Continued on page* 208)



CARTON FORMER takes flat cartons from magazine, sets them up, closes the bottom, delivers them to filling unit—60 per min.



PACKAGES are automatically filled with one, two or three flavors of ice cream fed direct from continuous freezers.

Ice Cream Packaging System

Packaging line, consisting of two fully automatic units, forms, fills and closes 60 cartons per minute. One attendant for entire operation

A FULLY automatic ice cream packaging system, especially designed to form Philadelphia style linerless pint cartons, fill them with ice cream directly from continuous freezers, close and discharge them at speeds up to 60 per minute, was recently unveiled at the Valley Maid Ice Cream Co. plant in Los Angeles, Calif.

Two Separate Units

The system is made up of two units: A carton former, which removes flat cartons from a magazine, sets them up and closes the bottoms, and a filler that receives the formed cartons, fills them with ice cream, closes and delivers them to a conveyor for immediate transfer to the hardening room.

The carton former is a complete unit that may be obtained separately. It requires the attention of one operator, who keeps the magazine filled with flat cartons. When used as a part of the filling system its operation is synchronized with that of the filling and closing unit to furnish formed cartons at whatever speed may be required.

The filler and closer unit receives cartons from the carton former, fills them with one, two or three flavors of ice cream fed directly from continuous freezers, closes and discharges the filled packages. By the use of a special attachment fancy centers may be formed in the packages. Speed of this unit is normally 60 packages per minute, but it is governed automatically by the rate of flow of ice cream from the freezers.

A novel feature of the filling unit is the "no carton, no fill" device. If, for any reason, there is no carton at the filling station, flow of ice cream is automatically diverted to bulk cans without spillage. In the case of multi-flavored filling, each flavor is diverted to a separate can, thus preventing the mixing of flavors.

One Operator

The system automatically performs all the operations of setting up the carton, filling it from the continuous flow of the freezers, closing and discharging it ready for transfer to the hardening room. No manual adjustments are necessary to compensate for variations in the rate of flow of ice cream from the freezers. One operator is needed to keep the feed magazine filled with flat cartons.

Although the system was designed to fill Philadelphia style pint cartons, with a few changes, using available replacement parts, it can be made to fill tray-packages and other types of pint containers.

Sanitation Achieved

All parts of the units that come in contact with cartons or ice cream are made of stainless steel. Sanitation is achieved in several ways. In the carton former, cartons are handled by the operator in the flat form only. Surfaces adjacent to the ice cream are not touched by the operator. All filling parts are streamlined and easily disassembled for thorough cleaning. Chain driving mechanism is of open link type and easily flushed.

The units were made by the T. R. I. Engineering Co. of Los Angeles, a division of The Ray Industries, after several years of research and development. Carton formers are now in production. Filler and closer units will not be available until the completion of a new plant now under construction in North Hollywood.

LOADING TRUCK and trailer is simplified by dropping the trailer's runway 18 in. to bring the floor of both vehicles to equal height.

Low Trailer Runway Cuts

One tractor takes care of four trailers, under this system, while handling

BY loading and unloading its delivery route trucks direct from the trailers employed to haul demijohns of drinking water from a country spring to its city distributing plant, the Minnehaha Water Co. of Cleveland has eliminated the cost of one loading and unloading operation as well as the use of fixed platforms except for one small overflow dock.

Previously one tractor and one semi-trailer were employed to haul the full demijohns of water from the spring and to bring the empty bottles back. While the empties were being unloaded at the spring and the full bottles loaded, the tractor stood idle.

Idle Time

Arriving at the city end of the transfer, the tractor again stood idle while the full bottles were unloaded from the trailer onto the storage platform from which they were later loaded onto the route delivery trucks. Similarly, the tractor was idle while the empty demijohns were loaded onto the trailer for the return trip to the spring for refilling.

In these operations, both the full and empty bottles were handled twice. The full bottles were first unloaded from the trailer onto the storage platform and then loaded onto the route trucks. The empty bottles were first unloaded from the route trucks onto the storage platform and then onto the trailer for return to the spring.

Handling Reduced

Now, by the use of the same tractor and four trailers instead of one, the trailers are used as loading and unloading platforms and both the full and empty bottles are handled only once between the trailers and route trucks. This same principle has been employed for many years, even before the advent of motorized vehicles, by large milk companies. Borden's and Sheffield Farms, for example, haul iced cases of bottled milk from their pasteurizing plants in New York City to branches in the city and the surrounding suburban territory in insulated trailers. These are spotted in the branch so that the local wagon or truck route vehicles pass by the trailers to get their outbound loads and returning from their routes, unload the cases of empty bottles into the same trailers for return to the source of supply.

This method eliminates the ice box at the branch and the labor in and out of the ice box if one were provided.

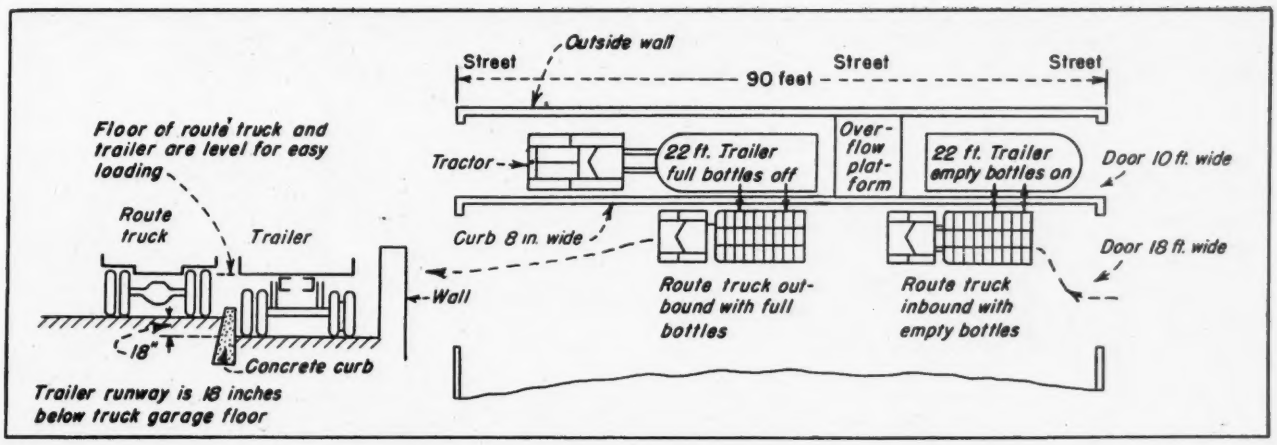
In the case of the Minnehaha Water Co., the need for refrigeration does not exist and the product is different, but the principle of operation is the same.

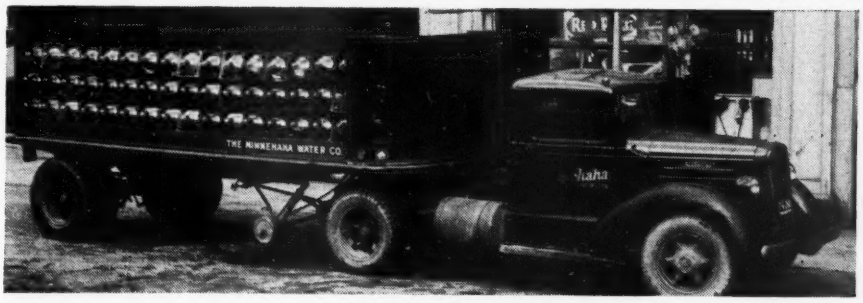
In the Minnehaha installation, a narrow runway 90 ft. long with doors 10 ft. wide at each end is provided for spotting the trailers as shown in the accompanying floor plan. Two trailers are backed into this runway, one from either end.

Loading Simplified

One trailer is loaded with full bottles for the outgoing route trucks and the other is empty to receive the empty bottles direct from the route trucks upon their return from the routes. A narrow concrete curb 8 in. wide on the top separates the trailer runway from the area in which the route trucks are loaded and garaged for the night.

The route trucks are loaded and unloaded by running them parallel





The cross section, above left, in this drawing, and the plan at right, show the runway and garage floor and how the loading is done.

This is one of the trailers used to carry the bottled water and return the empties between spring and distributor plant in Cleveland.

Bottler's Handling Time

of loads, at the distributor's plant, is reduced to one direct operation

with the trailers and close to the separating curb. To reduce the labor required in these loading operations, the floor of the trailer runway is 18 in. lower than that of the route truck floor. This brings the floors of the route trucks level with the trailer floors and thus reduces the amount of lifting required.

Each trailer carries a load of 237 full five-gallon demijohns of water weighing about 57 lb. each to give a total payload of 13,500 lb. On the return trip to the spring, each trailer carries a total of 326 empty demijohns and the enclosing wooden crates.

One Serves Three

The route trucks average about 79 full demijohns to the load so that one trailerload of full bottles will service about three route trucks. With 326 empty bottles to each trailerload, such a load will serve four route trucks with ten empty bottles over.

While the original intention of the plan was to eliminate all fixed platforms, the slight variations between the full trailerloads and the multiple of the route truck loads made it necessary to provide a small 10 ft. x 9 ft. overflow platform. This is located in the trailer runway between the rear ends of the two trailers as shown in the accompanying floor plan.

No Waste Time

In operation, three trailers are spotted overnight at the city distributing plant, two in the trailer runway, one elsewhere in the plant, and one at the company's spring 17 miles distant. To begin the day's schedule, the tractor, which is stored overnight in the trailer runway, hooks up to the trailer with the load of empty bottles returned by the route trucks on the day before.

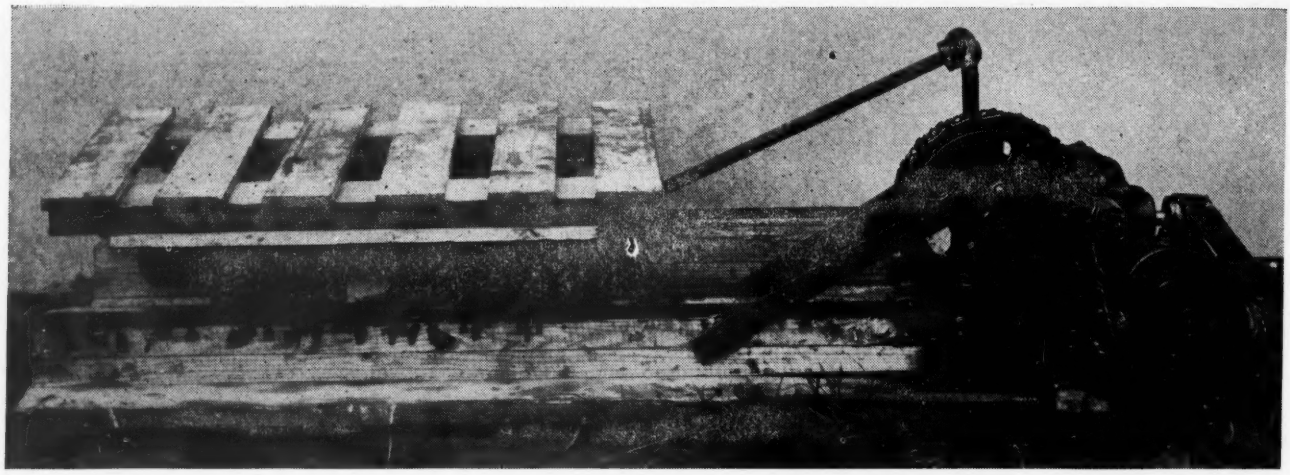
This trailerload of empties is hauled to the spring where the trailer is dropped and the tractor hooked up to a trailerload of full bottles loaded the day previous. This load is hauled to the city distributing plant.

Meanwhile the trailerload of full bottles hauled to the city plant on the last trip of the tractor on the day before has been loaded onto the route trucks. This trailer is then empty to receive the empties brought back by the current day's route trucks. The trailerload of full bottles brought to the city plant on the tractor's first trip of the day serves as the supply for additional route truck deliveries on the current day.

Constant Supply

The above operation of full bottles in from the spring and empty bottles out is repeated to provide at the city plant, at all times, a supply of full bottles and empty trailer space to accommodate the route truck empties brought back during the current day's work. At the end of each day there is a trailerload of full bottles at the spring and three trailers at the city plant. Depending upon the day's business, two of these trailers are loaded with full bottles and one with empties or two with empties and one with full bottles.

The tractor is capable of making three round trips to the spring daily. When only two trips are made, the tractor driver is utilized to make special deliveries on a route truck between 11 o'clock in the morning and 2 in the afternoon.

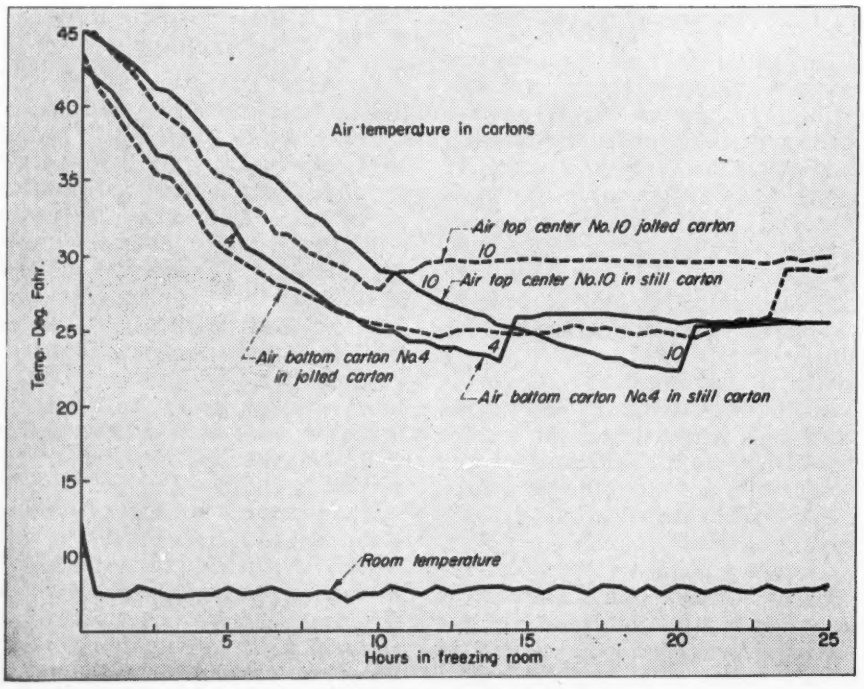


SPECIAL JOLTING DEVICE, used by the U. S. Department of Agriculture to simulate the shocks and jolts which normally take place in railroad cars in transit. Jolting terminates or prevents undercooling, resulting in ice formation in canned or bottled goods.

"Undercooling" Retards Freezing of Foods In Cartons

Freezing time of canned beans, delayed by "undercooling," is extended when cans are in cartons, further extended when cartons are stacked. Agitation, location of cans in cartons and arrangement of stacks all influence the freezing time

TESTS were undertaken to determine the length of time required to freeze cans in various positions in cartons, which were placed singly or in blocks and held at low temperatures. These tests were made to aid canners, wholesalers, cold storage operators and common carriers in the shipment and storage of cases of canned foods during cold weather. Data are the outcome of investigations conducted at the Plant Industry Station, U. S. Department of Agriculture, Beltsville, Md. Cases of canned foods can now be handled more intelligently at or below freezing temperatures.

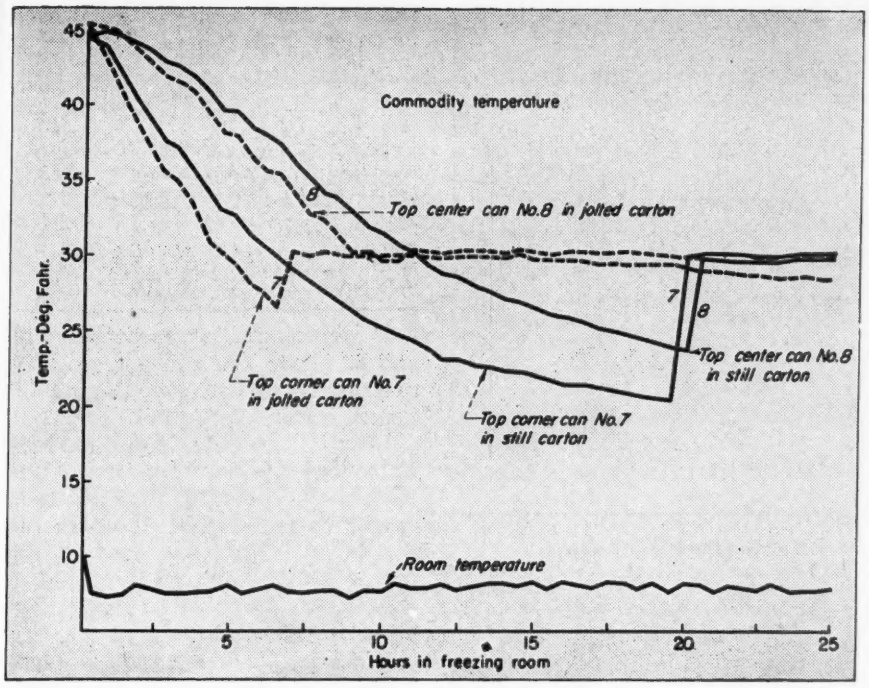


AIR TEMPERATURE in carton (see key diagram on opposite page).

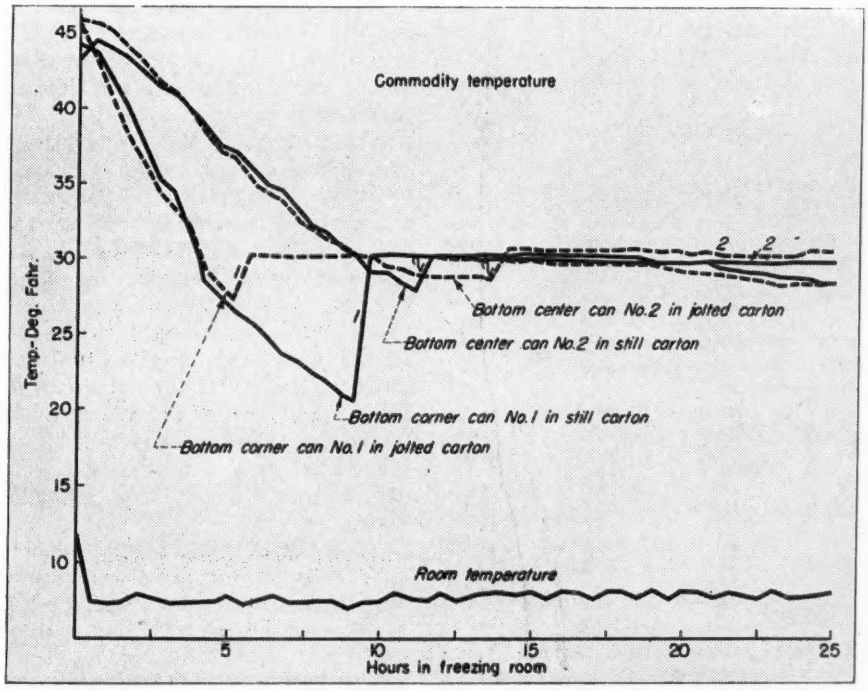
Cooling and freezing data on canned and bottled goods, published in Food Industries during the past year, showed that commodities in shipment can withstand low temperatures for some time, without damage. These tests, however, involved bare cans and bottles, rather than canned or bottled goods in cases.

Undercooling

Before foods freeze, they usually become undercooled below their freezing point, without ice formation. This phenomenon was exhibited by all the commodities that froze under the conditions of the tests. The undercooling effect helps to protect the goods in shipment or storage. It also simplifies freezing point tests, since the end of undercooling is usually marked by a rise of temperature to the true freezing point. The extent of undercooling and the freezing point can be estab-


Commodity temperature
Top center can No.8 in jolted carton
Top center can No.8 in still carton
Top corner can No.7 in jolted carton
Top corner can No.7 in still carton
Room temperature
Temp.-Deg. Fahr.
Hours in freezing room

TOP LAYER commodity temperatures (Table II and carton key).


Commodity temperature
Bottom center can No.2 in jolted carton
Bottom center can No.2 in still carton
Bottom corner can No.1 in still carton
Bottom corner can No.1 in jolted carton
Room temperature
Temp.-Deg. Fahr.
Hours in freezing room

UNDERCOOLING and freezing in bottom layer of cans in single stack of cartons (see Table II and carton key on right).

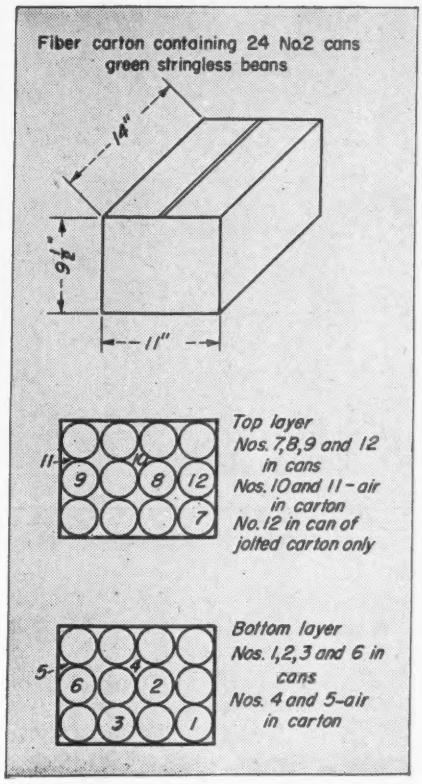

Fiber carton containing 24 No.2 cans green stringless beans
14"
9 1/16"
11"
Top layer
Nos. 7,8,9 and 12 in cans
Nos. 10 and 11 - air in carton
No. 12 in can of jolted carton only
Bottom layer
Nos. 1,2,3 and 6 in cans
Nos. 4 and 5-air in carton

TABLE I—Single Carton Test on Canned Green Stringless Beans.

Position of can	Freezing point	Time to reach freezing point (hr.)	Undercooling (hr.)	Undercooling (deg.)	Total time to freeze (hr.)
Top layer, corner ..... still	30.1	6	13½	9.7	19½
Top layer, corner .....jolted	30.4	4½	2½	3.8	7
Bottom layer, corner ..... still	30.1	3½	6	9.5	9½
Bottom layer, corner .....jolted	30.2	4	1½	2.9	5½
Top layer, end center ..... still	29.9	8½	9	9.3	17½
Top layer, end center .....jolted	30.4	7	3	3.1	10
Bottom layer, end center .... still	30.1	6½	17	9.0	23½
Bottom layer, end center ....jolted	29.5	6	3	2.9	9
Top layer, center ..... still	30.1	11	9	6.2	20
Top layer, center .....jolted	30.4	9	2	0.6	11
Bottom layer, center ..... still	30.1	8½	3	2.9	11½
Bottom layer, center .....jolted	30.3	6	8	1.8	14

lished with thermocouple readings.

Undercooling can be prevented or terminated by jolting the goods, resulting in ice formation. Agitation of this nature normally takes place in railroad cars on the move. Undercooled goods are not usually damaged, frozen goods generally are. In these experiments, the shocks and jars of railroad transportation were simulated by putting the test material on the platform of a special jolting machine. It is quite possible that undercooling of the contents of railroad cars can be extended when, and if, the railroads equip their cars with roller bearings.

Since no damage takes place in canned or bottled goods during undercooling, the processor or shipper has an opportunity to warm up the commodities before they actually freeze.

Bare Cans vs. Cans in Cartons

The bare cans showed an appreciable interval between the time they reached the freezing point, and the time of actual freezing. At 11.4 to 16.3 deg. F., green stringless

Note on TABLE I

The test was conducted in a room at 7.1 to 8.1 deg. F., with an average temperature of 7.5 deg. F. for 25½ hours. Temperature readings were taken of cans in various positions at half-hour intervals throughout the test. Temperature of the beans in the cans when test started was 43.3 to 46.5 deg.

No average freezing point is given because the carton contained cans from several different packs.

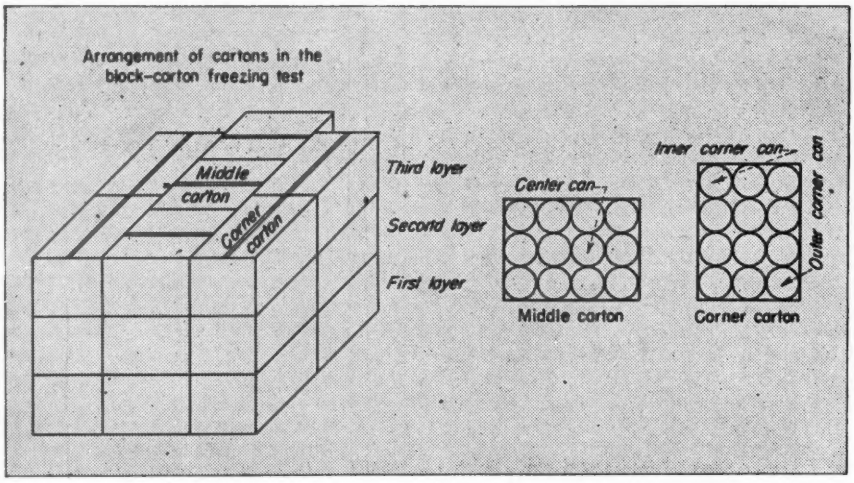


TABLE II—Single Carton Test on Canned Green Stringless Beans.

Position of can	Freezing point	Time to reach freezing point (hr.)	Undercooling (hr.)	Undercooling (deg.)	Total time to freeze (hr.)
Top layer, corner ..... still	28.7	9	9	5.0	18
Top layer, corner .....jolted	30.4	10	2	0.4	12
Bottom layer, corner ..... still	30.2	7	29	9.0	36
Bottom layer, corner .....jolted	30.1	9	2	4.2	11
Top layer, end center ..... still	30.2	11	20	8.2	31
Top layer, end center .....jolted	30.2	13	10	0.3	23
Bottom layer, end center .... still	30.1	10	14	7.6	24
Bottom layer, end center ....jolted	29.6	13	1	0.9	14
Top layer, center ..... still	30.0	15	17	6.9	32
Top layer, center .....jolted	30.4	5	19	0.3	24
Bottom layer, center ..... still	30.0	13	23	5.6	Did not freeze in 36 hr.
Bottom layer, center .....jolted	30.0	14	15	0.3	29

This single carton test was conducted with both still and shaking samples in a room at 10.7 to 17.1 deg. F., with an average of 15.3 deg. F. for 36 hours. Hourly temperature readings were taken throughout the test. The purpose of the test was to determine the length of time required to freeze cans at various positions in the carton. Temperatures of the beans in the cans when the test started was 49.8 to 51.8 deg. F.

No average freezing point is given because the carton contained cans from several different packs.

TABLE IV—Time Required to Freeze Canned Green Stringless Beans Packed in Single Cartons.

Test Number	Average room temp. (deg. F.)	Commodity starting temp. (deg. F.)	Total time to freeze (hr.)
1-Still-top layer, corner	15.3	50.8	18
1-Jolted-top layer, corner	15.3	50.6	12
1-Still-bottom layer, corner	15.3	51.8	36
1-Jolted-bottom layer, corner	15.3	50.6	11
1-Still-top layer, center	15.3	50.8	32
1-Jolted-top layer, center	15.3	51.1	24
1-Still-bottom layer, center	15.3	49.8	..*
1-Jolted-bottom layer, center	15.3	49.9	29

*Did not freeze after being exposed to an average temperature of 15.3 deg. F. for 36 hours.

TABLE V—Time Required to Freeze Canned Green Stringless Beans Arranged in Stacks of Cartons.

Middle layer

Test Number	Average room temp. (deg. F.)	Commodity starting temp. (deg. F.)	Total time to freeze (hr.)
1-Still-outer corner can, corner carton.....	7.7	61.2	26
1-Jolted-outer corner can, corner carton.....	5.9	47.2	11
1-Still-inner can, corner carton.....	7.7	Did not freeze	..
1-Jolted-inner corner can, corner carton.....	5.9	47.0	76
1-Still-center can, middle carton.....	7.7	Did not freeze	..
1-Jolted-center can, middle carton.....	5.9	Did not freeze	..

beans in No. 2 cans froze between 1 and 2½ hours when jolted. Still cans, on the other hand, froze between 2¼ to 6¼ hours.

A greater period of protection was provided against frost, when cans were packed in single cartons containing 24 cans each and subjected to freezing temperatures. At 15.3 deg. F., cans packed in cartons

TABLE III—Time Required to Freeze Green Stringless Beans in Cans Not Packed in Cartons.

Test Number	Average room temp. (deg. F.)	Commodity starting temp. (deg. F.)	Total time to freeze (hr.)
1-Still	12.3	32.9	2¼
1-Jolted	12.3	32.0	1¾
2-Still	11.4	38.2	4½
2-Jolted	11.4	37.3	1
3-Still	16.3	50.6	6¼
3-Jolted	16.3	49.9	2½

that were jolted, froze between 11 and 29 hours. Cans in non-agitated cartons froze between 18 and 36 hours.

Location of cans in the cartons influenced the freezing time. Cans located in the bottom layer took longer to freeze than those in the top layer. Similarly, cans in the center of the carton required a longer period of time to freeze than those in the corner.

Stacking 21 cartons in a block three high, further extended protection against frost damage of canned goods. The time required to freeze commodities depended upon: (1) Whether the cans were still or agitated, (2) location of the cans in the carton, and (3) location of the cartons in the stack.

At 5.9 deg. F., the outer corner can in the corner carton (jolted), froze in 11 hours. On the other hand, the outer corner can in the corner carton (still), froze in 26 hours at a room temperature of 7.7 deg. F. Inner corner cans in corner cartons took longer to freeze. In the jolted carton, the can froze in 76 hours, while the same can in the still carton did not freeze after 90 hours. Center cans in still or jolted cartons located in the middle of the stack did not freeze after 90 hours.

This report concludes the reports on the investigations conducted by the U. S. Department of Agriculture on the freezing and undercooling of canned and bottled goods. —The Editors.

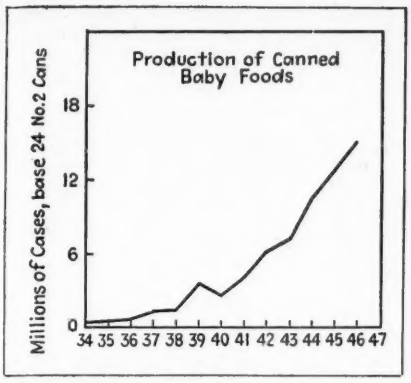
Acknowledgments

This research was conducted by D. H. Rose, senior physiologist, Division of Fruit and Vegetable Crops and Diseases, U. S. Department of Agriculture, and H. D. Johnson, transportation specialist, Transportation, Rates and Services Division, Office of Distribution, War Food Administration. M. N. Weatherhead, assistant mechanical engineer of the Fruit Growers Express Company, assisted the government officials in the investigation, which was conducted by the experimental cold storage laboratory of the Plant Industry Station, U. S. Department of Agriculture, Beltsville, Md.

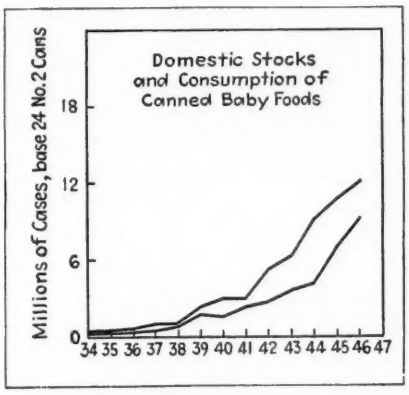
Baby Food Grows Up

With wartime rapid growth slowing down, baby food producers face the problems of a mature industry

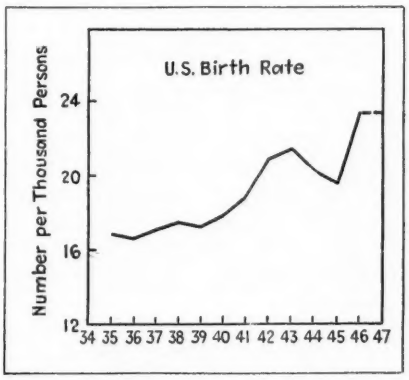
By SANFORD PARKER
McGraw-Hill Department of Economics



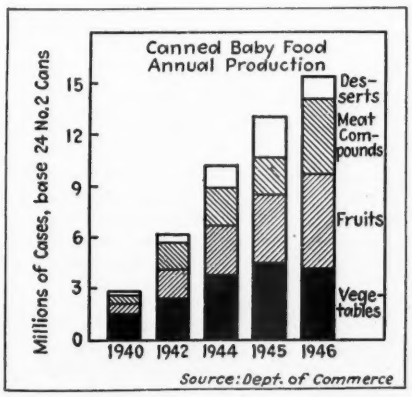
1. PRODUCTION of baby food increased many times during the war.


Domestic Stocks and Consumption of Canned Baby Foods
Millions of Cases, base 24 No.2 Cans
0
6
12
18
34 35 36 37 38 39 40 41 42 43 44 45 46 47

2. STOCKS began increasing rapidly as consumption grew less steeply.



3. BIRTH RATE declined slightly during the war, then rose, is now level.



4. SETBACKS are evident already in production of some luxury baby items.

BABY foods producers for the first time are facing the problems of a mature industry. They must now grapple with the question of adjusting production and distribution to a changing, and for the moment, declining demand. The infant industry that started in 1926 with one packer has grown to include some thirteen today.

Production of canned baby foods last year more than tripled its 1939 volume, and went 18 percent over 1945. But through 1947's first quarter, production is running one-third lower than in 1946. And the entire market is undergoing readjustment.

What, suddenly, has happened? A careful recheck of production, consumption, and inventory figures in the canned baby foods industry is in order. The statistical picture must be painted, too, against the backdrop of an altered general business situation.

Stocks Have Climbed

Looking at the statistics, we see that stocks have been climbing. At 10,000,000 cases of 24 No. 2 cans at the beginning of the year they were equal to 80 percent of the 1946 consumption. As a matter of fact, they were one-third larger at the beginning of this year than on January 1, 1946. And since January, 1945, stocks piled up so fast that they more than doubled. In fact, almost one-fifth of all 1946 output went into stocks!

But that's the least problem. The most important concern is that demand is slipping. And for this, there are many reasons.

One is the tightening of food budgets caused by soaring prices of all goods since the end of price control. Last month, in a discussion of the present abnormally high retail food sales (Food Industries, August, p. 112), it was pointed out how the economic basis for excessive food spending is being undercut. And such relative luxuries as canned baby foods suffer particularly when family spending is pinched.

An accompanying factor is that mothers are buying less processed food for their babies at any one time. Now that ample stocks are back on the shelves in stores, mothers have stopped trying to fill up cupboards. During the war years, this stocking-up created an artificially high demand. Because they were afraid of shortages, mothers begged to buy baby foods. Just as they lined up for blocks to get a chance at nylon hosiery. But now, as with nylons, they are back almost to a day-to-day basis.

Moreover, there are fewer working mothers now than there were

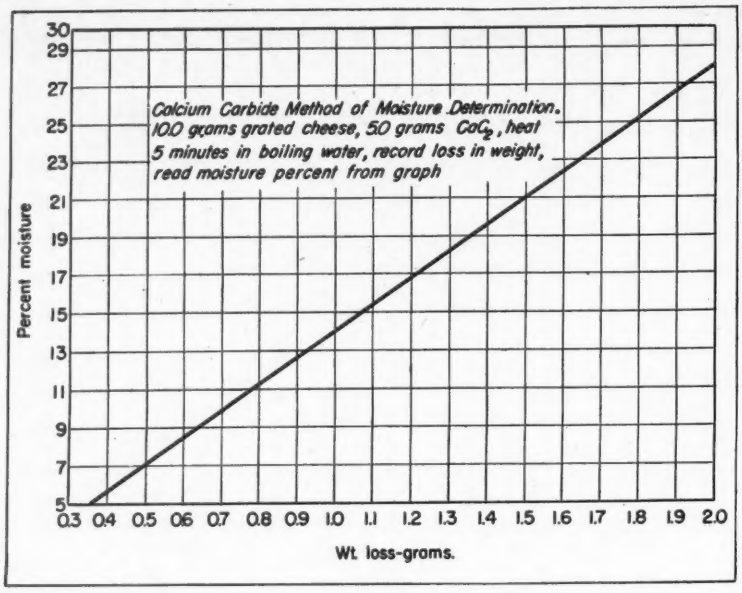
(*Continued on page* 202)

Potential Consumption

The present degree of saturation of the baby foods market is calculated as follows: Each new baby consumes 3.5 baby size cans a day, or (times 7), 24.5 cans a week, or (times 52), 1274 cans a year. That equals 318 No. 2 cans consumed by baby in a year (four small cans equal one No. 2 can). Births have averaged about 3 million a year for the past three years. So 3 million new babies could eat 954 million No. 2 cans; together with last year's babies and the year before's, they could eat three times that, or 2,862 million No. 2 cans. There are 24 such cans in a case*, so 119.26 million cases is the potential baby food consumption by all babies in any one year.

Production for 1946 was 15.4 million cases. That is only 13 percent of the 119.26 million case potential.

***For the purpose of comparability, data on canned baby foods have been converted to 24 No. 2 cans equals a "standard case." Most are packed in containers holding approximately 4 or 6 oz. It takes roughly 8 doz. of these small containers to hold a quantity of food equivalent to that contained in a case of 24 No. 2 cans.**



GRAPH and Table I show relation between moisture content of grated cheese and weight loss in the carbide method. Table II gives comparison of results obtained by carbide and other procedures.

TABLE I—Theoretical Weight Losses.

Moisture, percent	Weight loss, grams	Moisture, percent	Weight loss, grams
3	0.22	17	1.224
4	0.29	18	1.296
5	0.36	19	1.368
6	0.43	20	1.440
7	0.50	21	1.510
8	0.58	22	1.580
9	0.65	23	1.656
10	0.72	24	1.728
11	0.79	25	1.800
12	0.86	26	1.870
13	0.936	27	1.940
14	1.01	28	2.016
15	1.08	29	2.088
16	1.15	30	2.160

TABLE II—Comparison of Methods for Determining Moisture in Cheese.

Vacuum Oven Overnight	Bidwell Sterling Toluene	Analytical* Balance	Cenco Agate** Trip Scale
10.83	11.0	10.78	10.9
13.27	14.5	13.20	14.0
14.03	14.25	14.08	14.0
14.78	16.0	14.85	15.6
15.98	16.5	16.00	16.7
19.96	22.5	20.04	19.5
22.30	24.0	22.20	22.2
23.61	25.5	23.68	23.7
24.10	27.25	24.05	25.1
25.10	27.50	25.16	25.8

*The analytical balance was used to check the overall accuracy of the method.
**The trip scale is used for routine checks.

Quick Moisture Determination

Calcium carbide, heated with finely grated cheese, gives off acetylene. Weight loss of mixture accurately indicates moisture content of cheese

By E. R. SHEMIN and J. W. WAGNER, Chef Boy-Ar-Dee Quality Foods, Inc., Milton, Pa.

IN handling grated cheese at Chef Boy-Ar-Dee, we were faced with the need for a moisture determination that was: Accurate enough to permit control of drying to moisture contents within a narrow range; fast enough to furnish frequent results to the production staff soon enough after sampling to permit action on their part, and simple enough to be operated by an analyst of limited technical training.

With these objects in mind, we examined the methods ordinarily used for moisture determinations, and found that: The standard A.O.A.C. vacuum oven procedure was entirely too time consuming; the Bidwell Sterling method was too time consuming, and showed results at variance with the vacuum oven method up to ±3 percent; the Fischer volumetric titration method required too much analytical ability; various types of moisture meters showed too much variation in results. This latter we believe to be due to the variations in butterfat and salt contents of the various domestic and imported cheeses.

Carbide Methods Explored

We therefore investigated the possibility of using calcium carbide in a method based on the following well-known chemical reaction:

$CaC_2 + 2\ H_2O \rightarrow Ca(OH)_2 + C_2H_2$.

Triebold[1] showed three ways in which this reaction could be used to determine the amount of acetylene produced:

1. By collecting the acetylene and measuring its volume.
2. By determining the pressure developed by the acetylene when the reaction occurs in a closed system.
3. By the loss in weight of the mixture after the reaction has occurred.

McNeil,[2] in 1912, measured the volume of gas in determining the moisture contents of paints and soap. Blish and Hites,[3] in 1930, measured the pressure of gas produced in analyzing flour for moisture content. As far as we are able to determine, the loss in weight after the reaction has occurred is a new adaptation of the use of carbide in analyzing foods for moisture content.

We decided to discard the methods of determining volume or pressure of the gas released, because of the somewhat complicated apparatus and the need for fairly skilled analysts to handle these methods.

Weight Loss Method

We devised and checked the following method, which we have found to meet our requirements very satisfactorily:

Place 10.0 g. of finely grated cheese in a previously weighed 150 c.c beaker with glass stirring rod. Add a previously weighed amount of the finely powdered carbide (5.0 g. will be sufficient to react with a sample containing 28.13 percent moisture). Stir, place in a boiling water bath for five minutes, stirring occasionally, dry, reweigh and calculate the weight lost.

The mathematical calculation for the equation is as follows:

$CaC_2 + 2\ H_2O \rightarrow Ca(OH)_2 + C_2H_2$

$1.78 + 1.00 = 2.06 + .72$

Thus, a 10 g. sample of cheese of 10 percent moisture, tested as described, would lose a total of 0.72

(*Continued on page* 200)

EDITORIALS

LAURENCE V. BURTON, Editor

Living Under Taft-Hartley Law

UNIONS and employers should not try to win the last drop of blood for their respective sides as a result of the existence of the Taft-Hartley Law. The prospect of obtaining labor-management peace depends on using the law as a basis for living together—not for fighting each other.

Under the Wagner Law, labor-management relations were a one-way street with the NLRB acting as the watchdog to see that management did none of the prohibited acts. It was both prosecutor and judge. Under the Taft-Hartley Law it becomes a two-way street, but with one important, though little realized, change. The NLRB is now only the judge. The law provides for a separate prosecutor appointed by the President.

The wisdom of this provision should be apparent when it is realized that under the Wagner Law the combined prosecutor-judge could issue regulations that were later sustained by the courts and gave the board almost unlimited powers.

With the needed changes and the exercise of reasonable forbearance, there is hope for a moderation of the labor strife.

Will They Have the Courage?

SOME expansion plans have been postponed recently because of the high costs of construction—such as Standard Brands $13,000,000 program. Several other food processing companies have reviewed costs and decided to wait. All report reasonable profits. Profit margins for the rest of the year look conservatively good. It is not lack of money holding construction of new plants back. Rather it is the uncertainty and instability of price structures.

Waiting for costs of construction to come down significantly seems likely to prove futile. Unless there is really a bad depression with millions unemployed — and this seems unlikely in the near future — the only reduction in construction costs to be expected will be minor. One thing is certain, costs can't go back even to 1940 figures without a collapse of our national economy.

While consumers are becoming increasingly discriminating as to price and quality, markets for good quality processed foods are firm. Per capita figures indicate a continuing increase in consumption of these foods. Add to this, the birth rate is still going up and the estimated population is now 142,000,000 people, most of them customers for processed food.

The well-known fact that it takes more courage to buy at the bottom than at the top of a price swing makes it probable that those who are financially able to go ahead today—in spite of high costs and uncertainties—will be in a position to grab off more than their previous share of the market.

While there is a possibility of a recession and remotely, of a depression, one wonders if expansion plans that have been laid away will be reinstated if moderate expansions by plants, other than those that announce large building programs, are sufficient to supply the increased demand for processed foods.

Rising "Break Even" Points

MANY managements, both in and outside of the food processing industry, are worried about the rise of the "break even" point in their respective businesses. Usually such a point is a percentage of potential production capacity at which the total income from the sales barely covers the costs of operating the business. Every wage increase tends to shove the break-even point still higher and some companies find that they must sell a volume that is uncomfortably close to their capacity, if the business is to make any net profits. While their sales today are satisfactory in this respect, they are apprehensive of the future.

The affliction is industry-wide. But it is not wholly bad news unless there are compelling reasons why prices cannot be raised. Admittedly among consumer food items there are many psychological resistance points, especially in the mind of the sales manager. But the consumer is gradually becoming inured to what were once considered to be "bad prices," such as the 5-cent candy bar or carbonated beverage that now sells for 6 cents.

Nor is the preceding the only mitigating factor: Nearly every food plant in existence today was built before the war. Their combined capacity took care of the needs of about 135,000,000 people. Today, with the population estimated at 142,000,000, there are not many more food processing establishments than there were prewar.

If break-even points are uncomfortably high, the very population growth should provide the basis for ultimate readjustments to restore desired lower ratio and ultimate peace of mind. Ultimate is, however, to be emphasized, for raw material prices cannot be expected to turn downward until the excessive export demands for food are eased.

Iodine Reformers Too Hasty

AN example of good intentions gone haywire was H.R. 2717, introduced into the past Congress by Frances P. Bolton. She had the worthy intention of eliminating all endemic goitre by compelling the addition of not less than 80 nor more than 160 parts per million of iodine to all table salt.

Her proposal was to amend Section 301 (a) of the Food, Drug and Cosmetic Act to prohibit interstate commerce in table salt lacking the prescribed amount of iodine.

Only alert industrial observers on the Washington scene prevented its passage in a form that might have been very objectionable to the food processing industry. Since table salt is a very loose term, it might easily have been interpreted as meaning all salt used for edible purposes, even salt as an ingredient of processed foods. Butter makers, margarine makers, meat curers and canners were alarmed lest they be required by law to add a new ingredient, the effects of which could only be guessed at in the time available.

Wholly unknown was the possible effect of iodine on flavor or keeping quality of butter or margarine. Canners of vegetables could properly reason that an iodide would decompose under the temperature of sterilization, but what free iodine would do to the interior of cans was only a matter of conjecture. If the iodine were to be stabilized by a thiosulphate would it, too, decompose and liberate free hydrogen sulphide, leading to further technical problems, discoloration and consumer complaints?

No time was permitted by the Bolton Bill to find out about any of these problems, for the bill was to become effective immediately upon the President's approval. And at the hearing, the enthusiastic support for the bill by American Public Health Association, National Research Council, American Medical Association, U. S. Public Health Service, and even Food and Drug Administration presaged rapid enactment. The complete lack of knowledge about food technology among the bill's supporters nearly resulted in imposing on all food processors the use of iodine as an ingredient, without any preliminary study of what it might do or how to avoid disastrous consequences.

Fortunately the bill was modified to avoid imposing such unnecessary problems on the food processors. The industry can still procure uniodized salt.

Potato Surplus Rationalized

PEOPLE who have wondered why the government destroyed surplus potatoes can now get a sensible answer. Europeans, who must now buy their food (UNRRA is washed up), can get wheat for $0.08 a pound compared to dehydrated potatoes at $0.15. It's that simple.

Why there was a surplus is, however, something else. Plans of the U. S. Dept. of Agriculture have been based on an average yield of 155 bushels per acre. In 1945 the average yield was 164 bushels, for no apparent reason except good weather. Then came DDT. The department did not foresee its effect on potato yields that are now about 185 bushels. Thus, where about 375,000,000 bushels were expected, the nation's farms produced 475,000,000 bushels.

Of the unwanted surplus, some was sold to alcohol distillers at a $20,000,000 loss to Uncle Sam. But it yielded alcohol taxes of $109,000,000—which ain't hay.

Plain fact is that without the support price for potatoes there would have been a shortage such as existed in 1944. Remember?

Meat for Home Freezers

A PUBLISHED price list of meat to consumers for home freezing suggests important new competition to the accepted way of distributing meats. The advertiser, a locker plant in a small town you never heard of, sells whole lamb carcasses or ribs, quarters, sides or whole beef carcasses to consumers at packer's wholesale price plus $0.03 a lb. brokerage. And will age, cut, wrap and freeze to —25 deg. F. at $0.05 a lb. After that the customer takes it home to his own freezer or rents a locker at the plant for subsequent storage.

We have noted a tendency of many persons in the food processing industry to deprecate information about the locker plant and the whole frozen food business as a waste of their time. But it is advisable to keep abreast of changes and we don't see how anyone can laugh off the preceding figures. The $0.08 a lb. service charge is considerably less than the total moisture shrinkage between killing floor and consumer, to say nothing of trimming losses.

At today's high meat prices the incentive to short circuit the older methods of distribution is very great. And once there are sizeable numbers of home freezers in important marketing areas there arises a new competitive angle that can be annoying.

Employee Apathy

ONE of the strange, even pathetic, facts is the reluctance of workers to take any interest in their employers' affairs—or even their own affairs.

Three employers have told us of their futile efforts to develop a responsive feeling by workers for the problems that face the company. But the employees will have none of it, even though they can attend such meetings on company time. They would rather work than think.

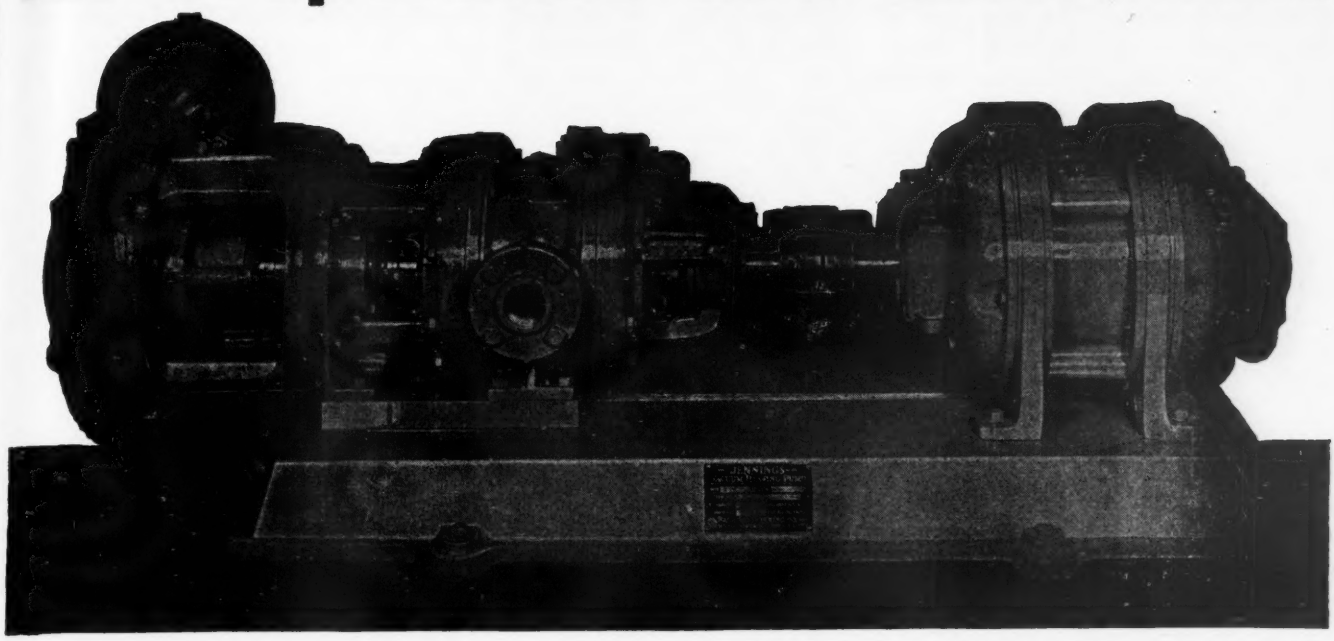
Another employer finds fault with his own workers for their failure to attend union meetings. Here the answer is that the conservative employee is fed up with the hot headed youths that dominate the union.

Apathy toward matters of important concern is disheartening. This, unfortunately, holds little promise for improvement.

Diabetic Food Market

WHILE it is true that about 2,000,000 persons in the United States are afflicted with diabetes, it cannot be honestly said that this figure is the size of the market for special foods to aid the sufferers. Reason: there is sharp disagreement among physicians about the proper diet for diabetics.

Nash—the Perfected Vacuum Pump for Evaporators and Condensers

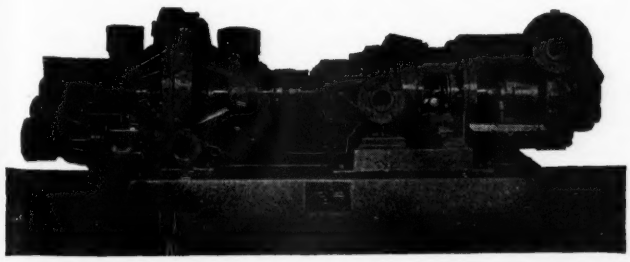


COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.



THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

NASH ENGINEERING COMPANY

SOUTH NORWALK • CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS

Frozen Meat Sundries Reach Limited Market

THE Armour Star label now appears on an experimental line of frozen meat sundries, including sliced beef liver, veal sweetbreads, veal heart, veal kidneys, chopped beef, oxtail joints and pork brains.

Most of the products are packaged in a transparent cellulose wrap or in cartons with Cellophane windows. The Armour label is imprinted on the film.

The beef liver is cut in uniform shape and thickness, four slices being wrapped in duPont 450 MSAT Cellophane and placed in a set-up chipboard carton. Cartons are overwrapped with Cellophane. Net weight is approximately 1 lb.

The oxtail joints are tied together with string and placed on a cardboard backer and overwrapped with Cellophane to make a neat flat package.

Armour & Co., Chicago, in packing these meat sundries has included instructions for cooking.

Plastic Seal

BY using a new plastic material instead of solder on its metal containers, American Can Co., New York, has achieved greater eye-appeal.

Developed by the company early in the war, the plastic is a taste-free organic compound that is said to be tough and impermeable to moisture. The Navy used it extensively to line fresh water tanks aboard naval vessels and tested it as a corrosion inhibiting coating for the hull and under water parts of ships.

Unlike soldered cans, which have a one-half inch stripe of solder showing at the side seam, the plastic is applied in such a way as to be invisible on the inside of the seam. Lithographed containers can carry their design all the way around the can.

The plastic sealed container is not suitable for products that generate pressures within the can, that require a vacuum pack or that must be processed. It has been found satisfactory for chocolate-flavored powders, waxes and soluble coffee.

They Call It Bing

A BLEND of cane and corn syrups flavored with mapleine and called Bing Pancake Syrup is being packed by Victor Neustadtl & Co., New York.

Distributed in 1 pint bottles, the product is welcomed on the syrup-starved grocery shelves.

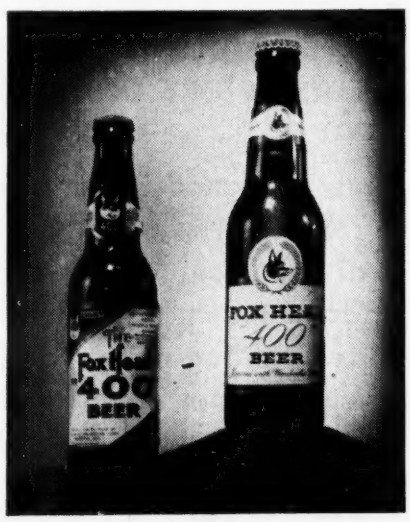
Salty

INTERNATIONAL SALT CO., INC., has announced the introduction in test areas of an improved Sterling Salt packaged in colorful round and square containers that dramatize the fact that the salt is always free running. The round package contains 1 lb. 10 oz. and the square package holds 1 lb. 8 oz.

Dominating the face of the wrap is a picture of the company's animated character, Salty, who is shown in a running position with the words "Free run'n" on his legs.

The back panel carries recipes that feature methods of using Sterling Salt in food preparation, cooking, canning and pickling. The top of the package has a spout for easy pouring.

The attractive blue and red carton is eye-catching in store display.



They Brewed a New Label

THE Fox Head Brewing Co., Waukesha, Wis., mindful of close competition ahead, engaged the New York industrial design firm of J. Gordon Lippincott & Co., Inc., to restyle the labeling of Fox Head "400" Beer. The company aims to consolidate consumer recognition and acceptance in advance of competition expected in the market as a result of increased supplies and fewer distributional difficulties.

Elements of the new design were chosen and developed with an eye for use in newspaper, magazine and truck advertising, as well as point of sale displays in stores and bars. Simplicity is the keynote in comparing the new with the old, as illustrated by the accompanying photograph.

Ice Cream Maker Caters to Consumer

PRODUCER of a commercial powdered ice cream mix for some time, Dean Milk Co., Chicago, has developed a similar product for the consumer trade.

The mix is a combination of heavy cream, milk, sugar, vegetable stabilizer, U. S. Certified color, vanillin and vanilla flavoring. A cup of water is the only ingredient to be added at home. Five oz. is said to make six servings.

The company also is marketing prepackaged ice cream in four flavors, vanilla, chocolate, strawberry and pecan toffee. Standard Philadelphia pints are used, the cartons being designed to correspond with the flavor—a different color for each kind.

Babies, Please Note

BACON, a favorite with babies, is used as the base for a new meal-in-one infant product by Gerber Products Co., Fremont, Mich.

Gerber's Strained Vegetables and Bacon with Rice primarily consists of peas, bacon and rice. Dried yeast is added to give extra food value.

This new product recently was placed in national distribution.

Fish Loaf

IN a further expansion of its seafood line, Atlantic Coast Fisheries Co., Boston, has put on the market a new fish loaf, ready for fry southern style. It is packed in 14½ oz. tins.

The loaf is made of mackerel, high in vitamin A and D content, as well as calcium and phosphorus. It is suited for making fish cakes.

Quick Identification

WITH an eye on today's competitive market, Milprint, Inc., Milwaukee, has redesigned the cheese packages of Fisher Dairy and Cheese Co., Wapakoneta, Ohio.

The 2-lb. bricks of pasteurized process cheese are wrapped in pouches composed of du Pont 300 MAT Cellophane coated with standard cheese coating formula.

For quick variety identification, each type of cheese wears Cellophane of a different background hue. Smokey is a rich light brown; Swiss a deep marine green; American is cherry red, Brick is aqua, and Pimiento is orange. Lettering is in black.

For the Manufacturer

BASIC food ingredients now generally available to bakers and food manufacturers are Carragar and Krim-Ko Gel, products of Krim-Ko Corp., Chicago, and distributed by Commodity Brokers, Inc., New York.

These products stabilize, emulsify and act to form gels and films. They are desirable in the manufacture of confections, desserts, baby food, mayonnaise, sausage, processed cheese and marshmallow.

According to the company, formulas and instructions are being developed by Krim-Ko's development laboratory and are sent to manufacturers who request them.

Can't Crab About This

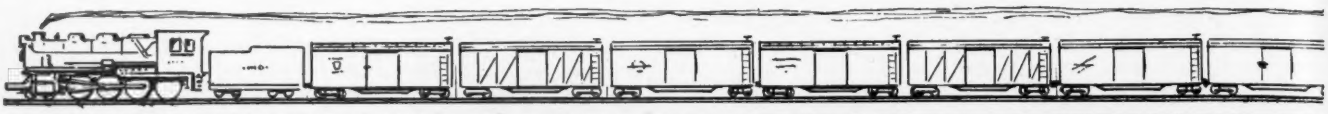
SPAGHETTI truly glorified is spaghetti with crab meat. Golden Grain Macaroni Co., Inc., Seattle, is packing that combination in glass jars and distributing it under the Golden Grain label.

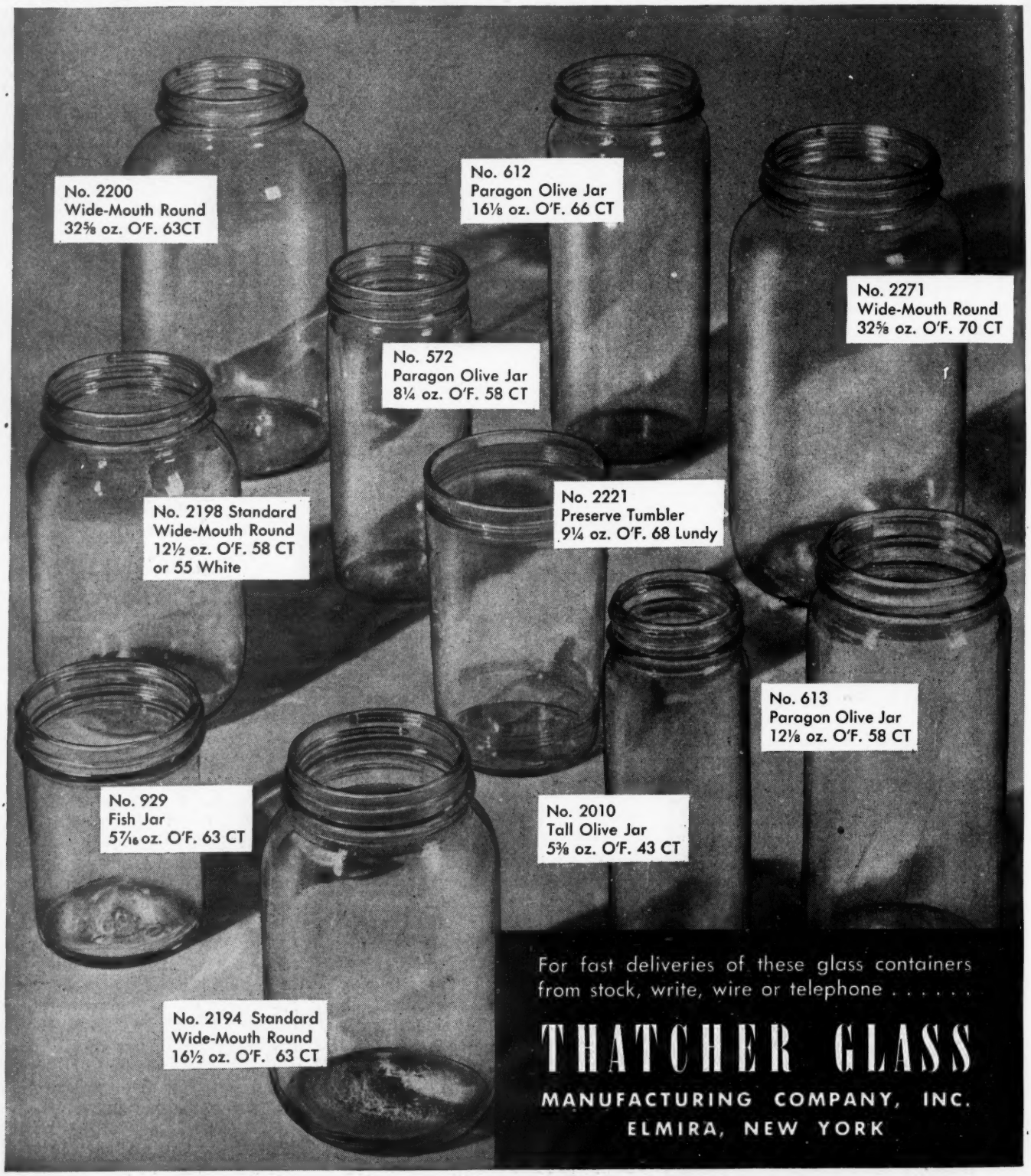
A dish known as Crab Chuppino has been a favorite at San Francisco restaurants for some time. It consists of semolina spaghetti with fresh crab meat blended with a highly flavored tomato sauce. The macaroni company has spent several years in research on the problems encountered in canning crab meat. In packing, the crab is constantly checked and rechecked for spoilage.

The manufacturer advises the consumer to place contents of jar in a casserole and bake in a moderate oven for 15 minutes. It should be served with grated cheese. Ingredients beside spaghetti include crab nectar, tomato puree, crab meat, salt, peanut oil or cottonseed oil, garlic, spices and water.

The vapor-vacuum sealed jar holds 1 lb. and is labeled in yellow, red and blue.

Available for **IMMEDIATE SHIPMENT—**





For fast deliveries of these glass containers from stock, write, wire or telephone . . . . . .

THATCHER GLASS

MANUFACTURING COMPANY, INC.

ELMIRA, NEW YORK

Five-Grain Bread

A RECENT addition to the ranks of foods packaged in tinplate is a new bread made of five grains—rye meal, cracked wheat, rice bran, barley flour, cracked oats and soya flour. Further enrichment is obtained by adding vitamin B complex, iron and niacin.

Designed for use by fishermen, hunters and campers, the thinly-sliced loaf has a high protein, mineral and vitamin content. Caloric content of the bread is approximately 1140 calories, making it highly suitable for overseas food parcels.

Wuest Laboratories, Inc., New York, the manufacturer, plans a line of five-grain cookies to join the bread. Expected to make their appearance before the end of the year are applesauce, oatmeal, carrot and sour cream cookies.

Accent

MONO SODIUM GLUTAMATE, the vegetable protein derivative, is now being packaged especially for the institutional trade.

Industrial food processors have been using this product in their operations for several years. Due to limited production facilities, however, the majority of restaurants, hotels and institutions never have had the opportunity to become thoroughly familiar with its advantages.

Ac'cent is the name International Minerals & Chemical Corp., Chicago, has chosen to appropriately suggest what effect the protein derivative has on natural food flavors.

International packages this vegetable product under two other brand names—Mei-Wei-Fen and Shirayuki. The former goes to the Chinese trade here and abroad and the latter to the Japanese.

The Orientals have considered Mono Sodium Glutamate a table necessity for many years and regard it as essential as table salt.

Ac'cent, Mei-Wei-Fen and Shirayuki are packaged in 4 oz., 1 lb. and 10 lb. containers.

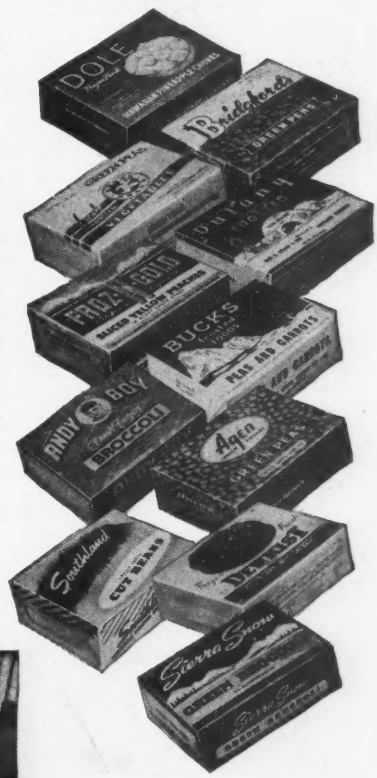
Two new, attractive additions

to products wrapped on our Model FF

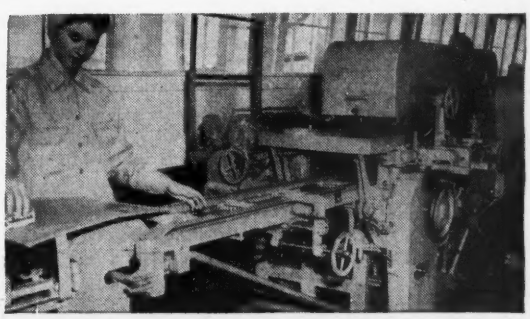
The impressive variety of products wrapped on our Model FF is convincing evidence of the many advantages offered by this most modern of food wrapping machines.

Its speed of up to 100 packages per minute means low wrapping costs. Quick adjustability permits the wrapping of many sizes. Handles goods in open boats as well as in cartons. Is adaptable to practically any type of wrapping material and registers printed material by electric eye. Compensates for variations in the size of packages due to freezing. And all parts coming in contact with the package are rust-proof.

For lowest wrapping costs and a package that assures real sales appeal and utmost protection to the product, get the facts about the Model FF. Write our nearest office.



PACKAGE MACHINERY COMPANY
Springfield 7, Massachusetts
NEW YORK CHICAGO CLEVELAND ATLANTA DENVER
LOS ANGELES SAN FRANCISCO TORONTO



Model FF in plant of Rocky Bay Fishing Co., Gloucester, Mass.

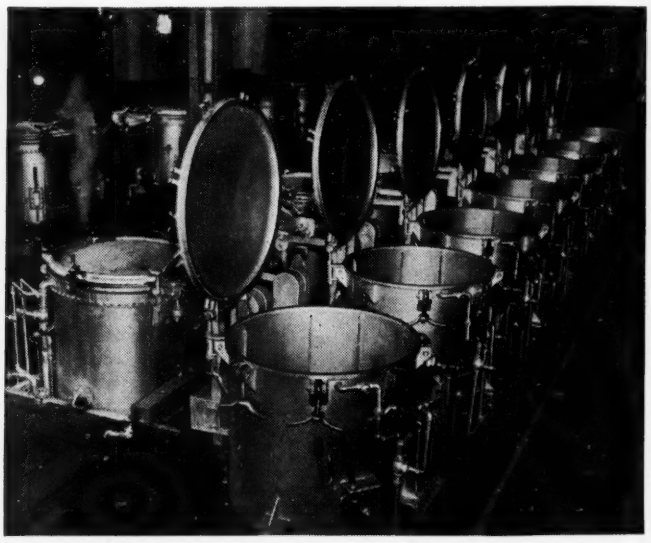
PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

CANNERS LIKE CROWN SERVICE...

THE G. S. SUPPIGER CO.
PACKERS OF FAMOUS BROOKS BRAND FOODS

Mr. G. S. Suppiger (right), president, and Mr. Herbert H. Droste (left), vice president and treasurer, of The G. S. Suppiger Co. conferring with Victor Kronold (center) St. Louis District Sales Manager of Crown Can. The conference is in the St. Louis, Mo., offices of The G. S. Suppiger Co.

Display of company products which feature Brooks Brand.



Battery of Cooking Retorts in a Suppiger Plant.

Belleville, Ill. Plant . . . original location where Gerhart S. Suppiger started 20 years ago. Other Suppiger Plants are located at Collinsville, Ill., Converse, Indiana, and Mt. Summit, Indiana.

Mike Schotter, Plant Production Manager for all Suppiger Plants.

ONE OF A SERIES FEATURING CROWN CAN CUSTOMERS

CROWN CAN

THE NATION'S THIRD LARGE SOURCE OF SUPPLY

CROWN CAN COMPANY • PHILADELPHIA • Baltimore • Chicago • St. Louis • Houston • Orlando • Fort Wayne • Nebraska City

FOOD INDUSTRY NEWS

GENERAL

Registration of Food Research Made Goal of National Food Board

Record of all food and nutrition research being conducted would be kept up-to-date in this first register of its kind

A COMPLETE, continuously up-to-date register of all food and nutrition research projects in progress in the United States is the goal of a program now getting under way at the Food and Nutrition Board of the National Research Council in Washington.

The register, the first of its kind in the food industry—and perhaps more comprehensive than any similar project in any other industry—will list individual research studies under way in private industry, government agencies, universities, foundations, trade associations, etc. Projects listed will be broken down to reveal the kind of research undertaken — whether it involves food technology, chemistry, physiology, biology, psychology (public attitudes toward certain foods, for instance), or basic economic studies.

Although the decision to go forward with the project was reached only a month ago, the Food and Nutrition Board already has reports on more than 1,000 projects now under government auspices. The total is expected to reach 10,000 or more separate research studies.

The amount of detailed information available on a particular project will vary according to the willingness of the individual sponsor to furnish the information. Current plans call for making the register available to any person with a legitimate interest in such information. Food companies and others, who may not want to reveal trade secrets, can gain protection in two ways: First, they can report only that information that they want to put on public record; second, the Food and Nutrition Board expects to set up "classified" files that would be protected from public scrutiny according to restrictions specified by company or organization carrying out the research. As part of the program, the board is also compiling a roster of scientific and technical personnel engaged in food and nutrition research.

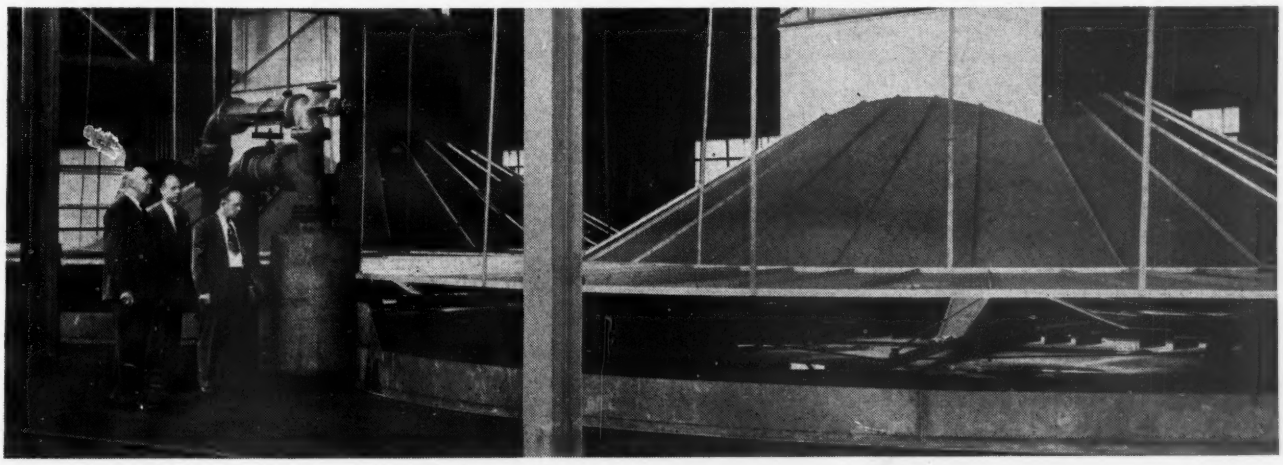
First official report on the program of the research register is expected to be made by the first of the year, or perhaps at the regular meeting of the Food and Nutrition Board in November. The project is being financed by funds from the Army Quartermaster Corps and by grants from the Nutrition Foundation.

The Food and Nutrition Board is studying the feasibility of setting up the records on punch cards to make quickly available complete information on the extent of research under way in a particular field. Plans also call for continuous review of the research register to keep it up-to-date as possible at all times. Dr. C. G. King, scientific director of the Nutrition Foundation, is chairman of the committee in charge of the program. Mrs. Mildred Ragan, technical secretary for the committee, and Dr. LeRoy Voris, executive secretary of the Food and Nutrition Board, are handling the operational details for the National Research Council. The Council's headquarters are at 2101 Constitution Ave., Washington.

Meat Institute Breaks Ground for Foundation

THE American Meat Institute Foundation recently broke ground on the University of Chicago campus for a $500,000, 3-story stone building for bacteriology, biochemistry, nutrition, histology, analytical and physical chemistry, and home economics laboratories. The basement of the building will house freezing rooms, coolers, storage rooms and pilot plant equipment.

The foundation was formed three years ago through the efforts of a special committee appointed by Wesley Hardenbergh, president of the American Meat Institute, in recognition of the need for increased scientific research in the livestock and meat industry. Meat packing companies throughout the U. S. have contributed funds for the foundation's financial support.



GENERAL FOOD'S SALT

This new circular grainer is the first portion of the $1,000,000 expansion program of the Diamond-Crystal-Colonial Salt division of General Foods, at Akron, O. The grainer is used to heat, purify, and crystallize brine into high grade salt by the Alberger process.

Food Sales Increase While Profits Drop

A DECLINE in net earnings among food companies during 1947, despite increased sales, is indicated from six of the financial reports issued recently. Standard Brands, Ward Baking, General Foods, Beatrice Foods, Hawaiian Pineapple and Carr-Consolidated Biscuit Co., showed decreased earnings, due almost entirely to their efforts to hold price lines in face of rising costs. Of these reports, only Sunshine Biscuits showed an increase, while Heinz offered no comparison with 1946.

Standard Brands' sales for the first six months totalled $147,463,527, compared with $123,054,424 in the corresponding 1946 period. Consolidated net income, after taxes, was $3,834,536, as against $6,440,209 in the 1946 period. Common share dividends were $1.09 per share, compared with $1.89 last year.

Ward Baking Co's. sales were $40,960,587 in the first six months of 1947, and $32,037,338 in the same period last year. Net income, however, was $1,150,892, compared with $1,314,174 a year ago.

General Foods' sales came to $189,435,000 for the first half of 1947, as against $151,648,000 last year. Net earnings were $8,136,000, equivalent to $1.46 per share of common, compared with $8,936,000, or $1.60 per share a year ago.

Beatrice Foods' report shows only the first quarter, during which net sales amounted to $42,615,009, compared with $33,626,841 in the first quarter of 1946. Dividends, however, were $1.17 per share, this year, compared with $1.21 a year ago.

A drop in fruit tonnage caused by unfavorable weather and operating conditions left Hawaiian Pineapple's net sales close to the previous year, despite price increases. The annual report for the year ended May 31, showed net income of $28,831,167, compared with $28,834,313 during the preceding year. Net profit, on the other hand, was cut from $2,366,885 last year, to $1,673,090 this year.

Because the two companies merged last December 31, Carr-Consolidated's 1946 comparisons are against the combined net income of the two companies during the first half of 1946. Net sales, this year, came to $10,996,350 compared with $11,764,849 the year previous. The net income amounted to $478,869, as contrasted with $1,147,098 the previous year.

Sunshine's earnings for the first six months came to $3,216,814. This compares with earnings of $2,736,816 during the corresponding 1946 period. No total sales figures are available for the two periods.

In its report for the last fiscal year, H. J. Heinz Co. showed an all-time high of $144,245,863 in total sales. Net earnings for the year amounted to $6,104,286 and common stock earned $4.14 after $268,308 was paid on preferred stocks.

New Dairy Institute Gets Wide Approval

QUALITY is the keystone for future progress in the dairy industry. This is the purpose of leaders in the milk and ice cream industry forming a new organization, known as the Dairy Products Improvement Institute, which was organized on June 19, 1947 in New York, N. Y. The principal office of the Institute is in the Liberty Bank Building, Buffalo 2, N. Y.

The membership of this new group is composed of ice cream manufacturers, milk dealers and companies handling middlewestern cream in the New England and eastern seaboard states. As the Institute's program progresses, it is expected that milk and ice cream companies in other sections of the country where milk and cream of necessity must be shipped in to local milk sheds, will affiliate with this institute.

The institute will work cooperatively with the Dairy Products Improvement Committee which has been working for the past several years with the Milk Industry Foundation, the International Association of Ice Cream Manufacturers and Dairy Producers, Inc., on the improvement of milk and cream shipped from the middlewestern dairy states to the East, South and Pacific coast. A definite program of inspection of plants producing sweet cream has been undertaken by the Dairy Products Improvement Committee with inspection work under the direction of Dr. Hugo Sommer of the University of Wisconsin.

Corn Drying Heads Market Research List

DEVELOPMENT of portable corn-drying equipment is the first project to be authorized under the Research and Marketing Act of 1946. Nine

"SAY THISH'S THE BESH RUM FLAVOR YET, WHA ISH IT?"

Wide World

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million dollars for the entire program of marketing research were made available in the Agriculture Department appropriation for fiscal 1948, although the bill was not passed until the end of July.

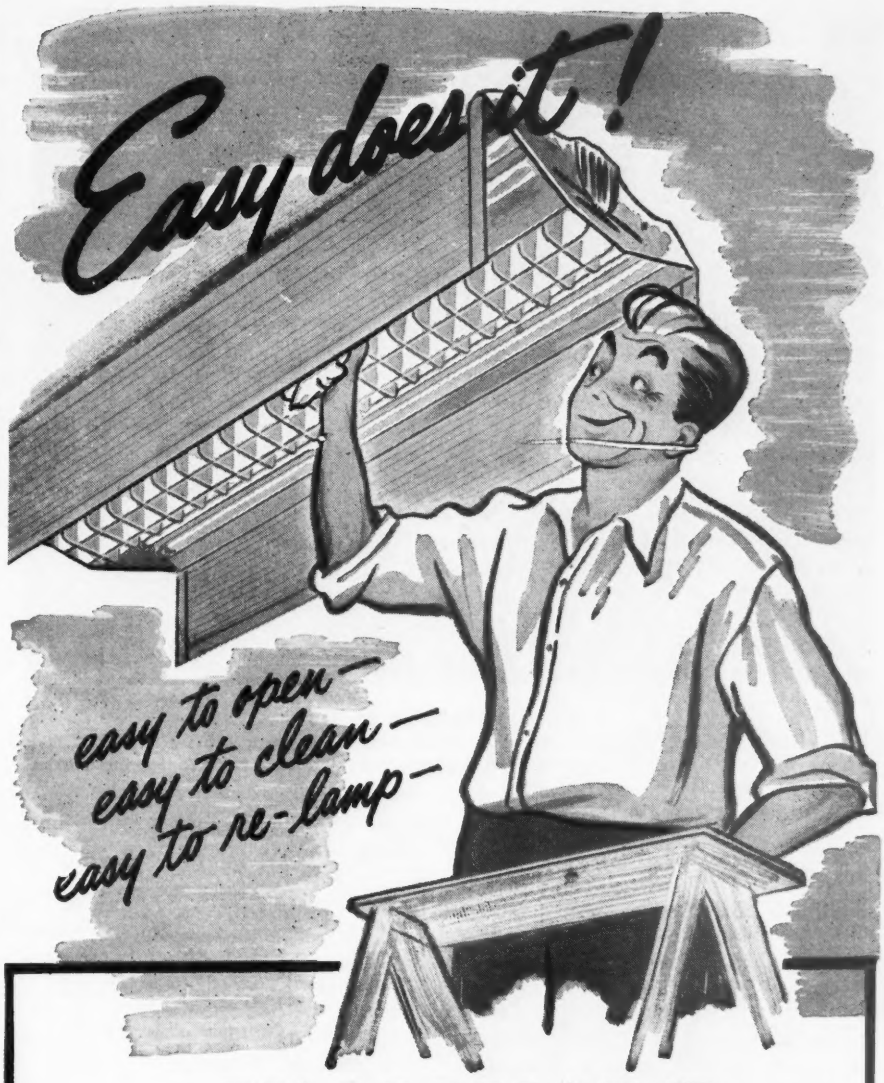
E. A. Meyer has been designated administrator of the R. & M. Act and his office is now in the process of approving suggested research projects. Half a dozen coordinators are to assist Mr. Meyer in this work, each coordinator being responsible for a type or group of commodities.

Choose Coordinators

Early in August four of the six coordinators and their responsibilities were announced as follows: Animal products, Harry C. Trelogan; fruits and vegetables, C. O. Bratley; field crops, J. Roy Allgyer; cotton, Maurice R. Cooper. No one has been named, as yet, for fats and oils, or forest products. Each of the coordinators will have a number of commodity advisory committees within his jurisdiction.

Appropriations for the various parts of the Research and Marketing Act were as follows: (1) Work in the State Agricultural Experiment Stations, $2,500,000; (2) research in the utilization of farm products, $3,000,000; (3) marketing research and service, $2,000,000, and (4) research in cooperation with the State Agricultural Experiment Stations, $1,500,000.

Initially, after assigning the $2,500,000 to the State Experiment Stations for their administration, a temporary reserve of $1,000,000 has been created for contingencies and developments later in the year.



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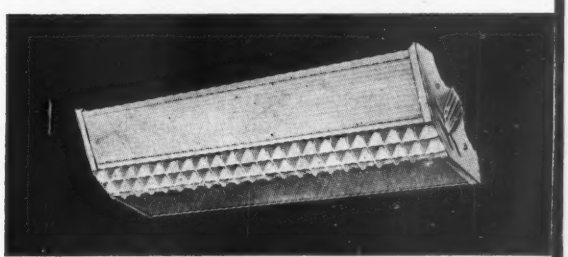

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Wide World

TURKEY ALL YEAR ROUND

North Carolina turkey farmers are among those helping to change the country's turkey eating habits. Frozen turkey steaks are here being cut and readied for the market.

The remaining $5,500,000 have been tentatively earmarked for the federal and state research agencies, which had made specific research suggestions during the past year, between passage of the Act and the first Congressional appropriation. Detailed outlines of those proposed projects which have been tentatively approved must now be prepared by the groups proposing to do the work. These outlines will be coordinated and approved as rapidly as possible and the program will be under way.

Although fish problems were to be covered by this Act, a jurisdictional dispute arose between members of the Department of Interior and the Department of Agriculture. As a result, no funds have been appropriated yet for research or marketing studies on fish, except in connection with the transportation of fish to market in connection with other food transportation problems. Clarification of this point may be expected.

Rising Output Costs Trail Price Advance

IN reporting on productivity and unit labor costs in the flour industry, the National Industrial Conference Board reveals that in the last quarter of 1946, output per manhour was 9 percent above a year earlier. Advances in payrolls, however, resulted in a gain of 8 percent in unit labor costs over the same period. It was not until October-December, 1946, that productivity showed improvement over the end of the war level.

During the second quarter of 1946, output per manhour declined as mills reported difficulty in getting supplies and were still confronted with the problem of converting to the higher flour extraction rate set on March 1. After a year and a half of peace, output was only at 1939 rates while unit labor costs were 74 percent higher. Grain prices were even farther above 1939 levels. The wholesale price of wheat in Minneapolis was 81 cents per bushel, in 1939, compared with $2.20 in October-December, 1946. In contrast, the wholesale price of wheat flour, in Minneapolis had only about doubled.

General Mills Reports A Successful Year

DOLLAR sales of General Mills, Inc., as well as earnings, were at an all time high, according to the annual report of the company for the fiscal year ended May 31, 1947. The company's operations were reviewed by Harry A. Bullis, president, at a press conference held in New York when Mr. Bullis returned from Europe. A new item in the company's line of home appliances was announced at the conference also.

Sales for the fiscal year were $370,932,427, with earnings amounting to $9,236,214, a gross profit rate of only 2½ percent. High level of operations was attributed in part to the rising level of prices. Earnings were $3.91 per share of common stock, in comparison with $2.91 the year before. The abnormal character of the year, with its extremely heavy demand for flour abroad, was responsible to some extent for the increase in earnings.

Reporting on his European trip through eight countries, including Germany, President Bullis emphasized the need for aid in two forms. One is for stabilized currency, so as to give the individual worker an incentive to produce. The other is for sufficient food to make a full day's work physically possible. Mr. Bullis, with his associates in General Mills' grain department, expressed satisfaction with the present wheat outlook, which insures coverage of domestic requirements, and the fulfillment of commitments to the European countries. A substantial carryover is in the picture also.

New item in the General Mills' line is a pressure type cooker sponsored by Betty Crocker and described as a pressure quick saucepan. Main feature of the cooker is a bimetallic cover which forms a tight seal automatically when air has been exhausted. Cooking with a minimum of water is thus possible, in comparison with the continuously vented type of pressure cooker.

Food Unions Join in Effort to Evade Law

TWO CIO unions in the food processing industry—United Packinghouse Workers and the Food, Tobacco, Agricultural and Allied Workers—have joined the parade of CIO labor organizations that hope to avoid the machinery of the National Labor Relations Board under the Taft-Hartley law.

The position of the unions is that they will not bring any actions against employers before the NLRB either as a complaint of unfair labor practice or by way of seeking bargaining rights. This does not deny the employer his right to bring action against a union if he deems it necessary.

Behind this union policy is the Taft-Hartley requirements that a union may not have access to NLRB procedures unless it has filed financial data with the Labor Department and, more important to these unions, its officials have made sworn affidavits declaring they are not Communists or harbor Communist sympathies.

Filing such affidavits might expose some officials to criminal prosecution if they are found to be false. The House Committee on Un-American Activities heard evidence in July from several former officials of the Winston-Salem (N. C.) local of the Food, Tobacco Agricultural and Allied Workers Union. They testified that at least 16, and possibly 20, of the 30 officials of the local union were Communists. The committee was trying to determine whether the local union's strike against the Reynolds Tobacco Co. was Communist-inspired.

Some Food Statistics Lost in Spending Cut

FOOD processors are losing some of the government statistical services to which they have become accustomed. It's part of the price of cutting the cost of government.

The Department of Commerce is dropping entirely its monthly canned foods stock reports of stocks and shipments. Census Bureau is reducing the scope of coverage of its monthly fats and oils "Facts for Industry" series. Size of the sample used in compiling data is being cut down, and the variety of commodity data reduced. Also, such factors as stocks, unfilled orders, etc., are to be discontinued.

Another "Facts for Industry" report to be similarly reduced in scope is that covering refrigeration machinery. And the series on farm and home freezer output is being discontinued.

Veto of Science Bill Dims Future Chances

THE long-awaited, much-discussed National Science Foundation Bill got through Congress at the end of the session only to meet a presidential veto. The bill, as it went to the White House, met the objections scientists themselves had against previous versions. It would have put control of the foundation's broad powers in the hands of a group of scientists appointed by the President and approved by the Senate. The director of the foundation, however, would have been appointed by the foundation members themselves, and would be responsible only to them.

The President's veto was based on several grounds. He stressed that the bill would give control of vast funds and vital governmental functions to a group of essentially private citizens who would be only part-time officials and who would

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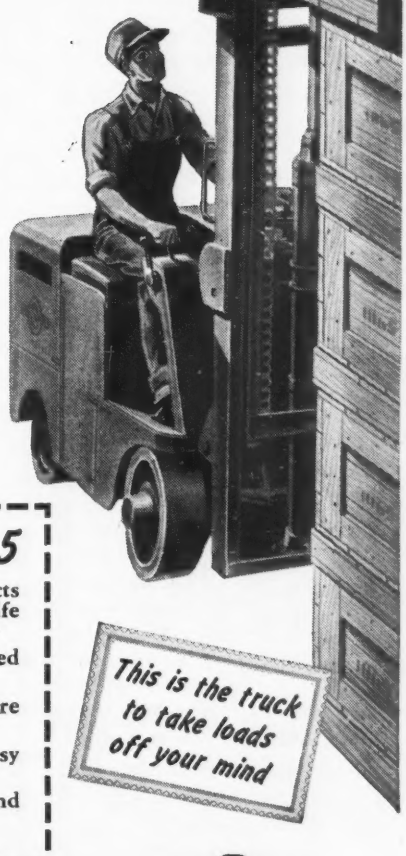

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Wide World

EASY ON THE BACK

This Kansas farmer is making excellent use of his shovel while he watches his truck-attached blower transfer his wheat harvest from a field truck to a storage bin.

not be responsible to the President. This, said the President, would insulate the foundation from control by the people "to an extent that implies a distinct lack of faith in democratic processes."

The President also noted that the qualifications prescribed for members of the foundation would insure that most of them would be individuals employed by institutions or organizations eligible for grants of funds from the foundation.

Administration advisors who initiated earlier science foundation proposals now feel that there is no immediate need for such a foundation. It is their contention that there are more funds now available for training scientific talent than can profitably be spent. They refer to funds from the GI Bill of Rights, and large sums now available to military and other agencies for research, besides that being spent in private industry. Since no funds were voted in the Science Foundation Bill, the veto represents no loss in this respect.

It is anticipated that the President will appoint an inter-agency Government group, during the fall, to examine need for coordinating Government research.

Plan 1947 Chem Show

AN advisory committee, composed of consulting chemists, chemical engineers, heads of professional societies, leading industrialists and editors, has been formed for the 21st Chemical Industrial Exposition, scheduled for Grand Central Palace, New York City, December 1 to 6.

General arrangements and management of the exposition are in the hands of the International Exposition Co., Grand Central Palace. Charles F. Roth is manager of the exposition.

DEVELOPMENTS IN DISTRIBUTION

Council Formed to Promote Frozen Foods

AFTER discussions extending over a period of several months, representatives of the frozen food industry have formally organized the National Frozen Food Council to promote consumer acceptance and preference for all frozen foods. It is not anticipated that the council will conduct technologic research, but will concentrate on coordinating and stimulating industry-wide programs to aid the sale of frozen foods.

The nine-man governing board of the council is composed of three representatives each from the National Association of Frozen Food Packers, the National Wholesale Frozen Food Distributors, and the National Food Brokers Association. In addition, the council is nominating for membership representatives of other groups such as retailers, refrigerated warehousemen, transportation groups, machinery and equipment manufacturers, agricultural colleges, and others.

The president of the council, who will be the executive head of the as-

sociation, had not yet been chosen, but a number of nationally-known business executives were under consideration.

The members of the governing board of the Council are as follows: C. Courtney Seabrook, of Seabrook Farms, Bridgeton, N. J.; George L. Mentley, Birds Eye-Snider Division of General Foods, Inc., New York City; F. J. Becker, Gresham Berry Growers, Gresham, Oregon; Benjamin T. Smith, Pratt's Fresh Frozen Foods, New York City; Alvin W. Langfield, Frozen Food Distributors, Inc., Oakland, Calif.; A. W. Huss, A. W. Huss Co., Milwaukee, Wis.; Fritz Brahm, Ashenfelter & Morrow, Inc., New York City; Clyde L. LeBaron, Clyde LeBaron Co., San Francisco, Calif.; and Ed W. Jones, Meinrath Brokerage Co., Kansas City, Mo.

At present the council's address is 1415 K St., Washington, 5, D. C.

Mexico Stops Imports Of Many Food Products

IN order to stop the drain on its dollar credits, Mexico placed in mid-July an embargo on the import of a number of fresh and processed food products.

The list includes canned animal food stuffs, fresh peaches and other fresh fruit, dried fruits, prunes, raisins and fruits canned in their own juice or in sirup.

The embargo, which also includes a wide range of raw materials and manufactured products, is expected to be placed at some future date by import quotas, which are now being discussed.

The move is considered to be the forerunner of similar actions that other countries will take when their dollar credits, accumulated during the war or from postwar loans, begin to run low.

FTC Complaints Again Hit Corn Refiners

THE Federal Trade Commission has hit the corn products refinery industry again. This time they charge 19 companies, producing 95 percent of all corn products sold in the U. S., with conspiracy to fix prices. This new complaint is another step in FTC's drive to outlaw the use of basing points and other forms of delivered pricing.

In a previous case against two corn products refiners, FTC won a Supreme Court decision, which found that the companies had discriminated in price between like purchasers of their products. FTC's evidence in this earlier court battle

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Press Association

WHEAT REACHES SKYWARD

No, this wheat isn't so strong that it supports the girls, but it is so high that it almost hides the top of the car they are sitting on. Scene is near Grand Forks, N. D.

centered around the different mill net return that the companies got by selling only at a delivered price.

Since this first corn products case was won, however, FTC lost a decision in the Circuit Court in the so-called Cement Institute case. That case, now pending before the Supreme Court, was based on collusion—rather than price discrimination—but it was thrown out because the court said FTC hadn't proved its charges.

The new complaint against the 19 corn products companies, seen in this light, is viewed as an attempt by FTC to prepare for a possible adverse decision from the Supreme Court in the Cement Institute case this fall.

The 19 companies are charged with collusion—and a dozen different kinds of activities are listed in support of such charges. By "throwing the book" at the industry, FTC will make the basing point and delivered price systems in themselves only part of the evidence, rather than trying to prove that such systems in themselves are evidence of collusion.

Policy Announced for Price Support

No one will benefit from the exaggerated effort to support prices of agricultural products by artificial price floors such as those required for potatoes. This is the substance of the conclusion of Secretary of Agriculture Anderson as officially stated in an address in California early in August.

The secretary complains that Congress required him to buy surplus potatoes in order to give price support. He did this against his own wish and judgment, because of the law. In speaking to the dried fruit industry he emphasized that there is no comparable legal requirement for dried fruit. He does not intend on his own responsibility to establish such a policy, for it would be wasteful and against the public interest. Instead he proposes definitely the following policy:

"The department plans in general to take these types of action: To encourage maximum use of dried fruits in foreign relief feeding programs and to purchase the maximum quantities that can be used in the national school lunch program. In addition the department will consider the practicability of subsidizing commercial exports of dried fruits, particularly prunes and raisins."

British and CCC Help In Dried Egg Buying

BRITISH purchases of dried whole eggs from the Commodity Credit Corp. totalled 38,264,000 lb. as of July 23, CCC announced.

Price paid by the British has varied considerably, depending on the unit size of the package. But in all cases the sale price covers cost of the eggs to CCC plus administrative expenses, with the British covering the shipping costs. In 14-lb. containers, the latest purchase cost the British about $1.30 per lb. Some shipments have been

in 5-oz. packages (for distribution to housewives); other shipments have been handled in barrel lots.

Including the eggs subsequently sold to Britain, CCC has purchased a total of 75,934,548 lb. of dried eggs this year, as of July 23.

Negotiations have been underway for the sale of some 18,000,000-20,000,000 lb. of frozen eggs to the British. These eggs have been bought by CCC at about 32 cents a pound on the average. Total purchases of frozen eggs by CCC amounted to 62,382,600 lb. so far this year.

In the meantime, the Department of Agriculture has announced that further purchases of dried and frozen eggs for price support purposes would be discontinued for the remainder of the year. Department officials believe that demand will be sufficient to maintain above parity prices for eggs without government buying. Average prices for eggs have been at about 93 percent of parity. Unofficial estimates point to a slightly heavier production of eggs for the rest of 1947, which is offset by smaller holdings of cold storage eggs (4,500,000 cases less than a year ago) and 30 percent smaller holdings of frozen eggs.

Department officials contemplate purchasing quality shell eggs if it becomes necessary to reinstitute price support buying within the next few months.

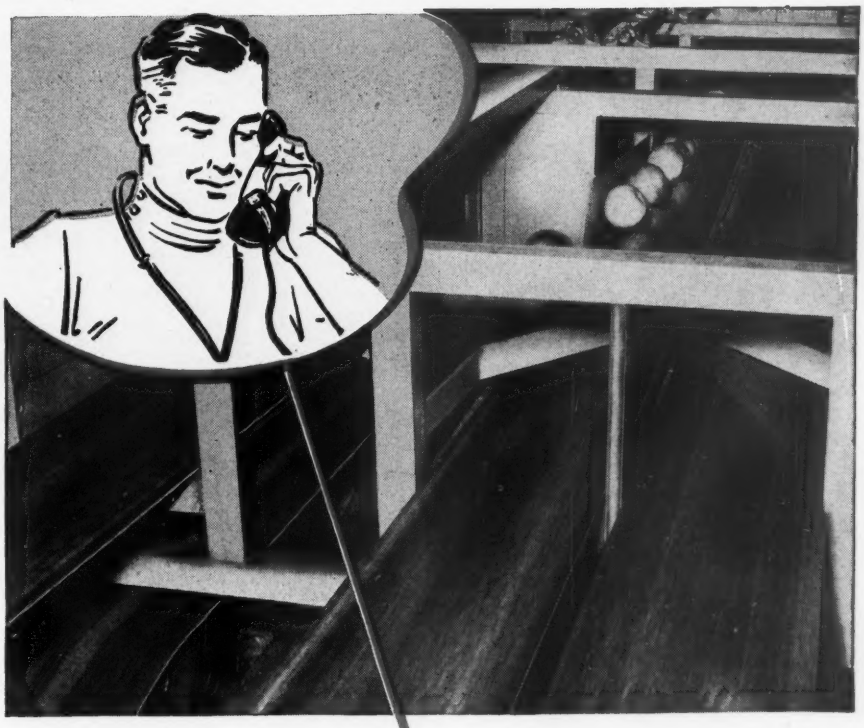
U. S. Dried Whole Milk Big Success in Mexico

DRY whole milk from U. S. dairies (FOOD INDUSTRIES, Nov., 1946, p. 124), being reliquefied in a modern $1,000,000 plant in Mexico City and distributed "experimentally" to undernourished children, is proving highly successful, according to the Production and Marketing Administration.

The plant's daily output of 100,000 quarts of reconstituted product, delivered by truck to widely distributed points throughout the city, is meeting higher consumer acceptance than the local raw milk product. This is probably accounted for by the low quality and palatability of Mexico City's fresh milk supply —due mainly to poor feed, climatic conditions, and the lack of incentive to build up dairy herds and market the fresh milk properly.

The experiment has apparently proved so successful that another plant is soon to be built in Mexico City, with 25 more planned throughout Central and South America.

The acceptability of reconstituted



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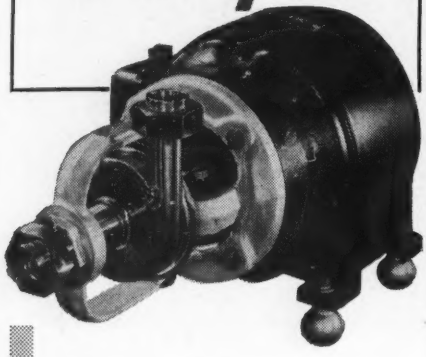

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Press Association

HELPING SOLVE POTATO SURPLUS

This potato crop was destroyed by an electric storm, at Fort Kent, Me., early last month. It appears to be an effective, if not an approved method of cutting potato supply.

non-fat dry milk is also being tested in South America. So far, the non-fat product seems to be fully acceptable in areas lacking adequate fresh milk supplies, especially with the addition of vegetable oils to augment both nutrition and palatability.

An entirely new market is thus being opened for U. S. dairy products—one which will utilize that drug on the dairy market—skimmed milk. How much of a problem this oversupply of milk has become was indicated by R. W. Woodburn of the California State Department of Agriculture. Speaking before the Midway Milk Producers Assn. at Chowchilla, Woodburn declared that California has a present surplus of market milk and that a remedy must be worked out immediately.

Children's Fund Buys Milk and Margarine

THE International Children's Emergency Fund, organized to furnish vitally needed foods to the children of devastated countries, is now in the process of spending $20,000,000, which has been made available to it from UNRRA and from donor governments.

Purchases in the United States, even when the fund's total budget of $70,000,000 is subscribed, are going to be limited to powdered whole and skim milk, and fortified oleomargarine, fund officials stated.

At present the U. S. Congress has appropriated $15,000,000 to the fund, and authorized appropriations totaling $40,000,000, providing that other governments furnish an additional $30,000,000.

Under the fund's policy, most of the money contributed by foreign governments will be spent in the respective countries. For instance, the $5,000,000 contribution from Canada will be spent for Canadian canned horsemeat, dried milk, and dried fish.

Purchases in the U. S. are being made through the Department of Agriculture.

Texas Checks Prices On Milk and Bread

A MULTI-PRONGED investigation of price-fixing in Texas, especially in the milk, bread and gasoline industries, is underway under the direction of the state attorney general's office.

Attorney General Price Daniel has assigned half his staff of 40 attorney-investigators to determine whether the anti-trust laws of the State have been violated by the recent increases in the retail price of a number of commodities.

Although the recent hike of the price of gasoline by the seven major oil companies operating in the state will occupy the main attention of the investigators, Daniel said, a group of assistants are looking into

the alleged uniformity of the price of milk and bread over the State.

The investigation of these two foods and their prices will center in El Paso, Fort Worth and Dallas at first, but the probe will be expanded later on to include the entire state.

Daniel said the milk and bread probe would take at least a month, and said that no anti-trust suits would be filed, if any violations are found, until after the investigation was completed. Meanwhile, retail merchants and bakery officials in the State said they welcomed the investigation.

More Markets Needed To Avert Rice Crisis

A MARKETING crisis in the rice industry may develop soon unless new marketing fields can be created and domestic consumption increased, Homer Brinkley, general manager of the American Rice Growers Association, warned recently.

Brinkley told 250 members of the Houston Farm and Ranch Club that the Texas rice crop was valued at $44,000,000 this year, making the problem of the rice farmer a problem of businessmen, also.

He pointed out that although rice is the staple food of more than 50 percent of the earth's inhabitants, the average domestic consumption is too small, being only 6 lb. per capita. He said the quality of American grown varieties of rice had been greatly improved in recent years and would weigh heavily with the consumer in his purchases, but added that the surplus for the 1947 crop has been estimated at 40 percent. He explained that relief purchases may absorb some of this, but the problem will come up again in future years unless additional marketing outlets are developed.

Milk Handling Rule Expected in January

PRODUCERS and handlers of milk in the 28 marketing areas, where federal orders regulate milk handling, are looking forward to a "statute of limitations" on claims against marketing funds by the marketing administrators.

Net effect of the proposed amendments to the federal marketing orders would be to outlaw claims by the administrators against handlers or producers—or vice versa—at the end of a two or three year period. The Department of Agriculture had suggested a three-year limit for re-

FOR A BETTER SANITIZING JOB...
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Petri dish showing no bacterial growth after the use of ROCCAL.
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In test after test Roccal has demonstrated its superiority over the old-fashioned germicides. It kills germs almost instantly yet it is perfectly safe, for in recommended dilutions Roccal is non-poisonous, virtually odorless and tasteless. It is stainless, non-corrosive and it does not irritate the skin.

Roccal has been approved by many leading health authorities as a sanitizing agent for general use in food packing plants, canneries, restaurants, bars, soda fountains, dairies, barber and beauty shops, etc.

Try Roccal just once for your toughest sanitation problem and we are sure you will say that here, at last, is the germicide you've been searching for . . . the germicide of tomorrow.

SAMPLE AND LITERATURE ON REQUEST

Industrial Division

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Dept. W-97, 1450 Broadway, New York 18, N. Y.

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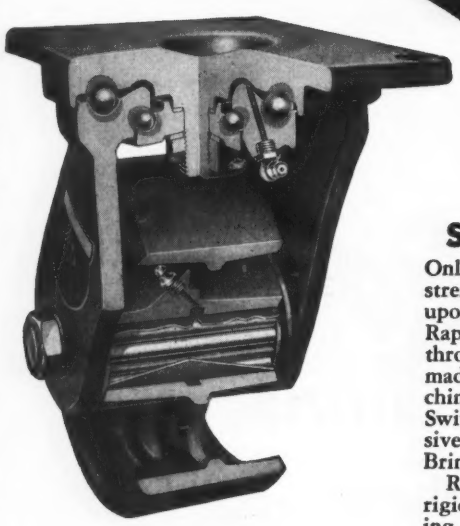
Modern floor trucks that meet today's requirements for greater efficiency in the handling of materials . . . easy on the man, the load and the floor. Durable, they retain that new, free-running action year in and year out. Two models and a variety of platform sizes to fit every need.



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Only a forging possesses the high tensile strength required to meet the stresses placed upon truck casters by modern industry. Rapids-Standard casters are "Steel-Forged" throughout. . . . All parts are precision made units with all wearing parts fully machined and assembled to close tolerance. Swivel ball raceways hardened by the exclusive Flame-Hardening process to 500-550 Brinell.

Rapids-Standard casters are made in both rigid and swivel types with a choice of bearing depending upon the service for which they are intended. Wheel types include metal, Resinoid and Rubber. These casters wear better . . . longer. They are standard equipment on all Rapids-Standard floor trucks.

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Models are available with single or double handles, solid plate or open nose. The combination of your choice—with wheels of Nicro-Steel (NH), Resinoid (DUR), Air wheel rubber tired (AGH) or General Pneumatic (GP).

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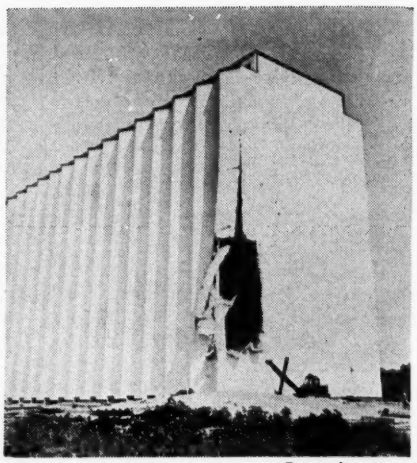


Press Association

GOTTA DARNING NEEDLE?

A 30 ft. rip in one of the 204 bins of the Union Equity elevator, at Enid, Okla., spilled some 18,000 bus. of wheat. Their height can be judged by the power shovel.

audits of accounts, but milk industry sentiment at the public hearing held in Washington, July 30, was that a two-year limit was preferable. USDA representatives appeared willing to go along with the milk industry's suggestion in this respect.

Milk handlers and producers had reported that maintenance of extensive records over long periods of time was burdensome and costly—and they had found themselves liable for claims based on actions taken more than three years prior to the time the claim was presented.

Those appearing at the public hearing will present briefs and additional arguments favoring their recommendation. Following these, the recommended decision will be handed down by USDA marketing officials. The industry will then have an opportunity to file exceptions from the proposed amendments, after which a final decision will be handed down. The amendment is expected to be made effective in January of next year. The new time-limit amendment will not be retroactive, Agriculture officials indicated.

Anderson Sees Need Of New Export Agency

SECRETARY OF AGRICULTURE Anderson's proposal for a U. S. agency to help sell U. S. surplus food and grain abroad remains what it was when it first broke into the newspapers—just an idea.

The idea originated from USDA's discovery that there is no government agency—like RFC—equipped to sell or exchange agricultural commodities under con-

ditions that private traders would turn down.

Anderson's proposal hit the headlines when a reporter queried President Truman about it—and Truman's answer seemed to substantiate press reports that the proposal was being shaped as part of the Marshall plan. Presidential advisers later unsnarled the story by emphasizing that Anderson's proposal was not for a world trade organization and that it had nothing whatever to do with the Marshall plan.

Anderson's idea had its beginning when the Spanish tobacco monopoly wanted to buy U. S. tobacco. The Spaniards didn't have dollars, and U. S. tobacco exporters didn't want Spanish pesos.

What Anderson has in mind is some sort of government organization that would be equipped to handle such sales. The Spanish tobacco deal, for instance, might go through if a government corporation had the authority to buy the tobacco and swap it for an equivalent amount of desired raw materials from Spain. The idea was not intended to encompass government purchase of surplus foods for dumping abroad. The projected organization, whatever it might be, would pay its own way.

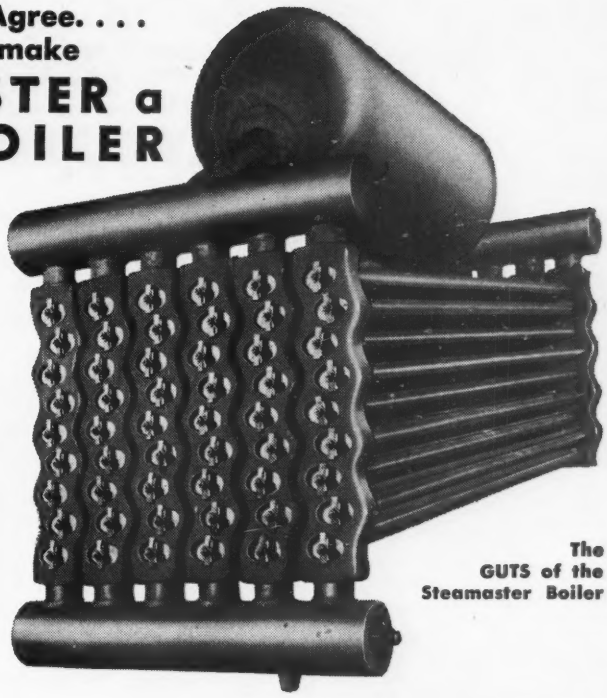
Agriculture officials point to the U. S. Commercial Co., RFC subsidiary handling trade with Germany and Japan, as a possible model for a similar agency in the food field. USCC has been importing German and Japanese raw materials and manufactured goods for sale in this country—the dollar balances acquired accruing to the account of the occupation forces in those countries.

Wide World

SOIL IRRIGATION

Plastic siphon tubes help lift water over edge of ditch in this Southwest effort to irrigate dry lands, thus converting them to suitable grazing areas. For full length story on soil erosion see page 71.

Power Engineers Agree. . . .
It's the GUTS that make
STEAMASTER a GOOD BOILER



WATER TUBE DESIGN

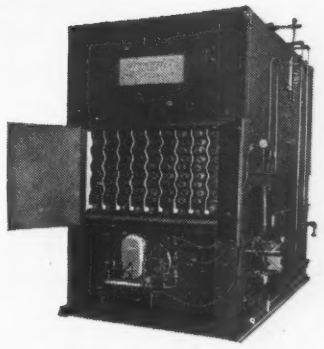
INCLINED TUBES

SECTIONAL STEEL HEADERS

LONGITUDINAL DRUM

The GUTS of the Steamaster Boiler

The food industries NEED BOILERS with PLENTY of GUTS!



In design, construction and materials, Steamaster builds boilers with the guts to give reliable efficient performance year in and year out.

QUICK FACTS about the advantages of the STEAMASTER Water Tube BOILER.

- ***All Steel Construction.***
- ***Positive Tidal Circulation of Water***—Maintains all parts at equal temperature.
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- ***Easy Inspection and Maintenance***—Every tube immediately accessible. Just open the heavily insulated access doors.
- ***Large Combustion Area . . . Three Pass.***
- ***Heat Baffling*** gives high thermal efficiency.
- ***Choice of Fuel—Gas, Oil or Coal*** or any combination of these fuels to meet the fuel requirements of your plant.
- ***Fully Equipped for Automatic Operation***—Finest accessories.
- ***A.S.M.E. Code—National Board Approved***—Inspected and certified by Hartford Steam Boiler Inspection and Insurance Co.
- ***Full Range of Sizes*** from 10 h.p. to 300 h.p. as illustrated. The Model A for 3½ h.p., 5 h.p. and 7½ h.p.
- ***Can Be Fired Over Rated Capacity*** . . . without loss of efficiency.

Throughout the Food Industries you will find Steamaster Automatic Boilers giving consistently excellent performance at low cost.

Power Engineers Agree:
STEAMASTER is the Boiler with PLENTY OF GUTS!

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Select the Right Insulation: Any insulation will save *some* money—but only the right insulation, correctly applied, will save the *most* money for the longest period of time. Because of its many advantages, leading refrigerating engineers have long relied on J-M Rock Cork Insulation for refrigeration service.

Get Correct Application: No insulation is better than the man who installs it. That's why every J-M Insulation Application Unit employs only skilled mechanics . . . each one thoroughly trained in all phases of up-to-date application methods.

25 Years Young! J-M Rock Cork Insulation was used back in 1922 to insulate this cold storage room of the Flora Produce Company, Flora, Ind. Because the job was *engineered right* and *applied right,* it is still providing dependable insulation, still saving money by guarding against spoilage.

J-M engineers can plan the same efficient, long-lasting insulating job for *you.* For details write Johns-Manville, Box 290, New York 16, N. Y.

JM PRODUCTS

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ROCK CORK

PROCESSING

F&DA Order on Cheese Prescribes Treatment

THE Food and Drug Administration is preparing tentative orders requiring nearly all cheese shipped in interstate commerce (1) to be made of pasteurized milk or (2) if not made of pasteurized milk, to be held in storage at not less than 35 deg. F. for a certain number of days, perhaps 60. The one major exception is Swiss cheese.

Hearings on the amendments to regulations now in force for Cheddar cheese, washed curd cheese, and Colby cheese—and to establish regulations for other cheeses not previously covered—were closed at the end of July.

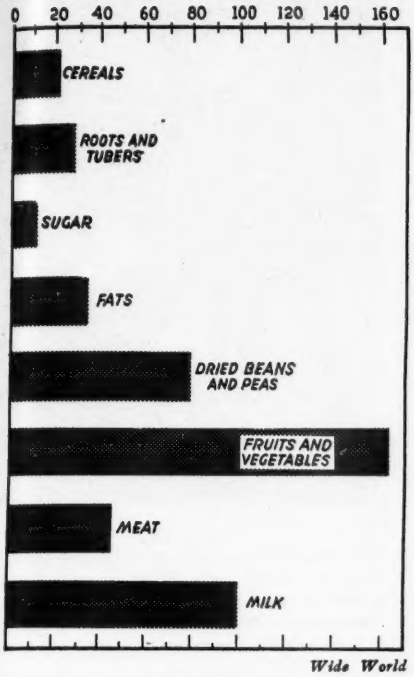
Interested parties appearing at the hearings have been asked to submit briefs no later than mid-December. Following that, a proposed order will be issued formally, and industry representatives will then have another opportunity to submit exceptions to the order. Hence it is not likely that the final order will become effective before the spring of 1948.

Ease of enforcement of the anticipated regulation has been made possible through the perfection of the phosphatase test developed by Drs. Sanger and Sanders of the Bureau of Dairy Industry, U. S. Department of Agriculture. With this test, first described in detail at the June meeting of the Ameri-

OUR PROMISE:
To continue to keep our wholesale prices down, so that our INDEPENDENT RETAIL GROCERS can give the housewife
HIGHEST QUALITY
LOWEST POSSIBLE COST
and so LICK INFLATION
THAT IS
THE BERNICE FOOD PLAN

SHE POINTS

Bernice Quality Foods, New York, used a well tested method for announcing the success of their plan to cut food prices up to 10 percent. Retailers were urged to pass along cuts and a survey revealed that plan was increasing sales.



1960's FOOD NEEDS

Here are FAO's estimates of the increases in food production that will be necessary between now and 1960, if an adequate diet is to be provided for the world's population.

can Dairy Science Association in Guelph, Ontario, it is possible to detect with simple laboratory equipment the presence of one pound of raw milk in 2,000 pounds of properly pasteurized milk—whether the test is applied to the milk itself or to products made from milk.

The dairy products to which the test has been successfully applied include fluid milk, cream, Cheddar, Swiss, and other hard cheeses; process cheese and cheese spreads; cottage and other soft, unripened cheeses; butter; buttermilk; fermented milk drinks; ice-cream mix; sherbet; chocolate milk; cheese whey, and (with less sensitivity) goat's milk.

Shortening Eliminates Bakers' Stale Returns

RETENTION of freshness, with elimination of stale returns to bakers and of waste in the home, through the use of a special new shortening was recently demonstrated by Swift & Co.'s bakery research laboratories.

This shortening has been developed specifically for use in bread and other yeast-raised doughs, where the monetary loss to bakers through stale returns amounts to millions of dollars annually and where the food loss to consumers through waste in the home amounts to millions of pounds of flour alone. George T. Carlin, chief of bakery research for Swift & Co., stated at this demonstration that stale re-

You Asked For It!

DURMA-GARD PROTECTIVE APRON

Designed by YOU to Help your Safety Program

PERMANENTLY FUSED EYE-LETS WITH STRONG TIE-CORDS

NO CLOTH STITCHING REINFORCED STRESS POINTS

SPECIALLY CONSTRUCTED TROUGH CATCHES DRIPPINGS

During a recent on-the-spot field survey, West talked with hundreds of industrial workers and safety engineers to determine what features they would like to see incorporated in a protective apron. The new Durma-Gard is the result—your own idea!

Durma-Gard is a *completely new* protective apron that provides *maximum safety* against acids, alkalis, grease and oils, and effectively resists absorption, dust, powders and other occupational hazards. Yet it weighs no more than 10 ounces, thereby permitting full freedom of movement and unhampered efficiency.

The Durma-Gard Apron also provides a specially-constructed "trough" which catches "drippings", thereby protecting legs and shoes. Made of clear, transparent "Vinylite", Durma-Gard washes readily with soap and water. Full cut, standard size.

Throughout the United States and Canada are close to 500 trained West Safety Consultants. To learn more about Durma-Gard, simply call the West representative nearest you.

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CRCO Processing Equipment

For Peas, Lima Beans, Whole and Cut Stringless Beans, all Tomato Products, Tomato, Citrus and Pineapple Juices.

Cuts Labor Costs

If you are packing Vegetables, Fruits or Juices, the CRCO Engineering Department can, through recommendations and plant layouts, help you to produce a quality pack with much lower labor costs.

The trend today is toward higher quality and less man-hours—a fact that CRCO has long recognized in the design of high-speed, automatic units that are synchronized to eliminate slow-downs at any point in the line. Each piece of CRCO Equipment is designed not only to perform its appointed task but also to keep pace with the balance of the line to insure an even flow and a much higher rate of production.

Send for any of the following Bulletins you may be interested in. They illustrate complete lines and equipment built by CRCO, together with typical plant layout charts and information that every food packer should have.

No. 1062—Pea and Lima Bean Lines
No. 1063—Whole and Cut Bean Lines
No. 1064—Tomato and Juice Lines
No. 1049—Fillers for Every Purpose
No. 1065—Labeling and Casing Machines
No. 1047—Complete Food Equipment Catalog

THE BEST OF Everything

CHISHOLM-RYDER CO. INC.
Niagara Falls, New York
FOR THE FOOD PROCESSOR

(82)

Wide World

SAP TAP
Sap tapping for maple sirup has gone modern, too. Here a flexible shaft and drill, powered by a gasoline motor, is being used on one of New York State's trees. The helper stands by in case of a heavy run.

turns for 1939, the last reported normal year of production, ranged from 7 to 10 percent of all bread delivered to grocers and that other statistics indicate a discard of 10 to 15 percent of bread sold to consumers because of lost freshness.

It is available in two forms and is the result of more than 15 years of research work on shortenings to obtain these freshness-retention properties. The research work was completed before the outbreak of World War II, but its manufacture was held up by war conditions. In its unblended form it is a superglycerinated fat known as esterine. It is used in the yeast-raised doughs with other shortenings as a pound-for-pound replacement, not to exceed 25 percent of the total shortening used. In its blended form it is known as tri-co, in which esterine is a constituent.

In either form it has the property of increasing the tenderness of bread and other yeast-raised bakery products as well as increasing their keeping and flavor qualities. It is applicable to sponge and straight doughs including the short-fermentation or "no-time doughs."

It is claimed that tenderness in bread and rolls is increased 30 to 35 percent over that of similar products made with usual shortening. Bread retains newly baked freshness 48 hours longer than when ordinary shortening is used. Increased yield of dough is obtained through 3 to 8 percent increase in absorption of water in the dough. The percent of increase in absorption is dependent upon the dough richness. Rich doughs permit lower increase in absorption

than do ordinary or lean doughs. When esterine itself is used in 4 percent lard bread doughs, the replacement is 25 percent maximum. When used in a high fat content dough, the replacement should be 10 to 12 percent of the regular shortening used.

U. of Maryland Gives Course in Food Tech.

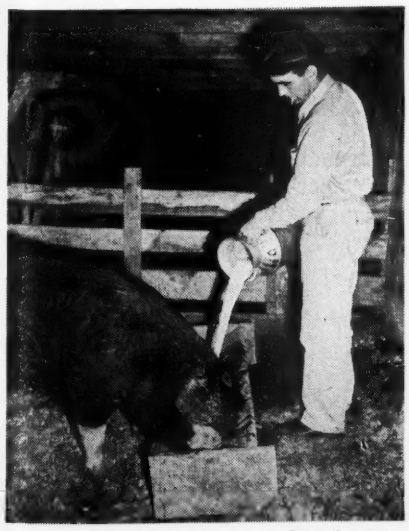
THE UNIVERSITY OF MARYLAND is this year opening a four-year course in food technology. The curriculum, they maintain, is being established in response to requests from leading canners and freezers for trained men.

Termed a course in the preservation of horticultural crops, it supersedes the courses offered by the department of horticulture of the university over the past ten years.

Improve Method for Bottled Orange Juice

JUICE INDUSTRIES, INC., Dunedin, Fla., has introduced a new step in citrus canning, which produces an orange juice that can be safely packed in bottles for the beverage trade, B. C. Skinner, president, has announced. He believes that a 6-oz. bottle can be sold at 10 cents in competition with 5 cent soft drinks.

Mr. Skinner said that his company combined the use of an homogenizer with the Mallorizing (flash sterilization) process to obtain for the first time orange juice that will not "settle" after it stands. The homogenizer is used in the juice line just ahead of the flash sterilizer. The 265 deg. F. temperature does not change the flavor.

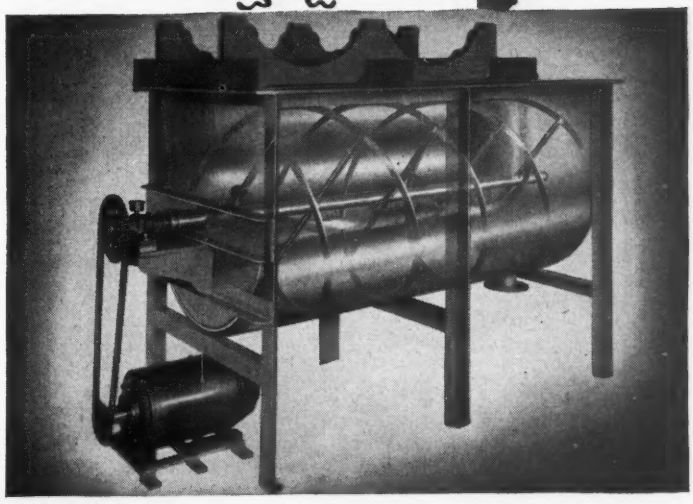


Press Association

HOGS ON MILK BINGE

During the Dairymen's strike in Louisiana, at least one hog enjoyed extra rations. The dairy farmer shown here decided that this method of disposal was simpler and safer than trying to deliver the milk to the strike-bound market.

STAINLESS STEEL EQUIPMENT
Custom Built to Your Specifications



Planning new corrosion resistant processing equipment? Keep in mind that between blue print and finished vessel the experience, skill and plant of your fabricator may determine how much return you get from your investment—how long and how well it will serve in your plant for your special applications.

We are specialists in stainless steel and alloy fabrication – work exclusively with these metals. Our experienced staff of engineers and mechanics – the special tools, dies and machinery we use – give you increased returns from your expenditures for stainless steel equipment. Consult with us.

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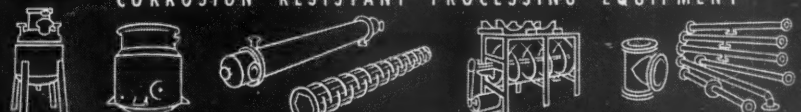
Guards Alloys in Fabrication

SEND FOR THIS VALUABLE BOOK

A request on your letterhead will bring our guide, "What to Look For When You Specify Stainless Steel for Your Processing Equipment."

CORROSION RESISTANT PROCESSING EQUIPMENT



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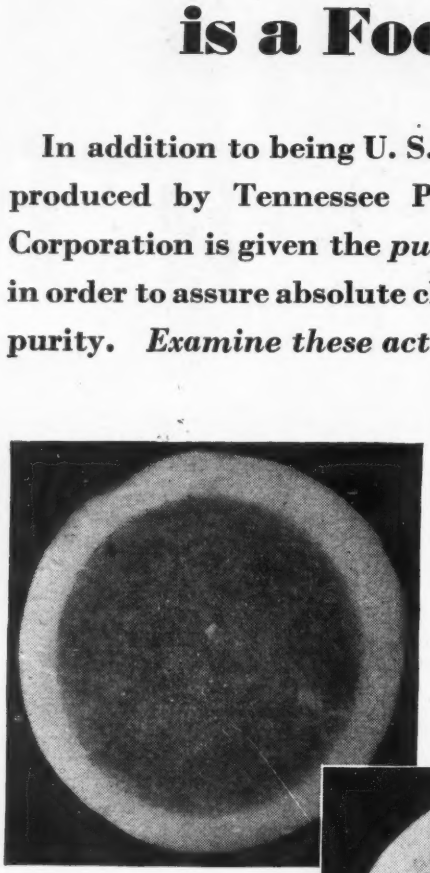
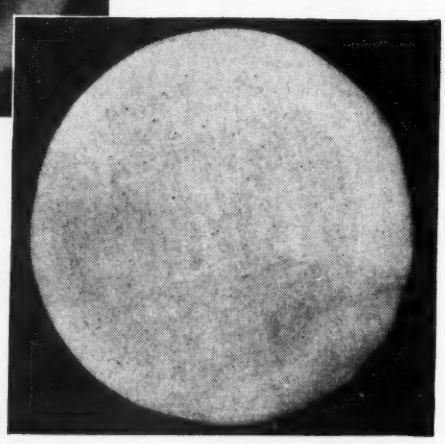
Sodium Benzoate is a Food Product

In addition to being U. S. P., Sodium Benzoate produced by Tennessee Products & Chemical Corporation is given the *pure milk sediment test* in order to assure absolute cleanliness and highest purity. *Examine these actual photographs:*



LEFT — *Sediment from ordinary U. S. P. Sodium Benzoate.*



RIGHT — *Sediment from Tennessee Products & Chemical Corp., U. S. P. Sodium Benzoate.*

If you are interesed in high purity along with the best of service, specify *Tennessee Products Sodium Benzoate.* Available in both flake and powdered form.

TENNESSEE PRODUCTS & CHEMICAL CORP.

General Office: Nashville, Tenn.

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FOOD-O-MAT AVAILABLE

Because of its success in speeding up store service while cutting down on space, Grand Union Super Markets is making its Food-O-Mat available to other chain and independent grocers. This is one of many sections.

RAW MATERIALS

Crop Reports Remain On Optimistic Side

IN general USDA people reported nothing to indicate material change in the late summer fruit outlook from that reported in earlier USDA crop reports. One exception was that peach shipments from southern states were not holding up because of bad weather conditions and worms. Peaches were small and total shipments were about one-third lower than earlier estimates. Georgia shipments were off as much as 40 percent. Apple crop in the Shenandoah Valley was off sharply over last year but this has been known before. Otherwise, USDA officials report no change from July crop report estimates. Truman Nold, Apple Institute, anticipates no material change in apple crop estimates from July report. Weather has been favorable. Scab in general was no worse than many previous years, except perhaps for parts of Ohio. Commercial growers generally keep scab under control.

On vegetables, tomato blight hit some eastern states in early August. Untreated fields were in bad condition, but extent of damage was undetermined. Onions have been hit by extreme July heat in Midwest. Earlier hail damage to onions in Elba, N. Y., area is likely to cut

crop back only 15 to 20 percent, rather than earlier estimates of a 50 percent loss. Pea pack in northern tier of states will yield just what packers want, smaller yield but higher quality. Snap beans came in late in early sections and early in late sections, resulting in bunching of crop, which may result in reduced supplies later in the season.

Corn estimates continued downward, the result of the excessive heat in the corn belt in late July and early August. Surface moisture was badly needed for this crop and the government's August 1 estimate of 2,275,000,000 was regarded as highly optimistic.

Oats were also expected to drop a bit under the government's July estimate of 1,247,000,000 bu. Wheat, on the other hand, was regarded as likely to go as much as 75,000,000 bu. above the July figure of 1,435,000,000 bu. estimate of USDA.

SCHEDULE OF EVENTS

September

1-4—American Society of Mechanical Engineers, fall meeting, Hotel Utah, Salt Lake City, Utah.
2-4—American Meat Institute, annual meeting, Palmer House, Chicago.
4-5—Dairy Industry Conference, Stocking Hall, Cornell University, Ithaca, N. Y.
8-12—Instrument Society of America, second annual conference and exhibit, Stevens Hotel, Chicago.
15-19—American Chemical Society, 112th national meeting, Pennsylvania Hotel, New York.

October

6-7—Packaging Machinery Manufacturers Institute, 15th annual meeting, Hotel Sheraton, Springfield, Mass.
12-17—The Master Brewers Association of America, 60th anniversary convention and brewing industries exposition, Public Auditorium, Cleveland.
20-22—American Oil Chemists Society, annual fall meeting, Edgewater Beach Hotel, Chicago.
20-22—Bakers Supply House Association, annual convention, Edgewater Gulf Hotel; Edgewater Park, Miss.
23-24—National Pickle Packers Association, fall meeting, Hotel Continental, Chicago.
27-29—International Association of Ice Cream Manufacturers, annual convention, St. Moritz Hotel, Miami Beach, Fla.
30-31—National Research Corp., high vacuum symposium, Cambridge, Mass.
30-Nov. 1—Milk Industry Foundation, St. Moritz Hotel, Miami Beach, Fla.
30-Nov. 1—American Bakers Association, golden anniversary convention, Stevens Hotel, Chicago.

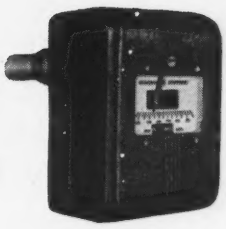
November

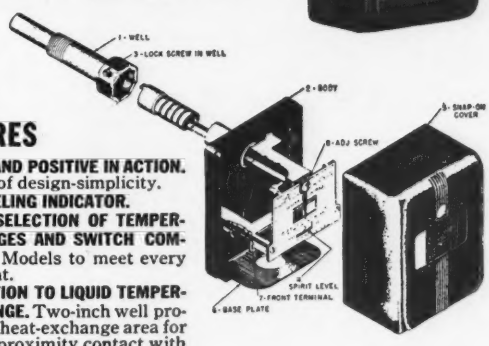
2-6—Supermarket Institute, 10th annual convention, Hotel Sherman, Chicago.
10-12—Grocery Manufacturers of America, 39th annual meeting, Waldorf-Astoria, New York.
17-21—American Bottlers of Carbonated Beverages, 29th annual meeting and international beverage exposition, Convention Hall, Atlantic City, N. J.
18-19—Packaging Institute, 9th annual forum, Hotel Commodore, New York.
19-20—American Butter Institute, annual convention, Congress Hotel, Chicago.

New

L-578 SERIES

IMMERSION THERMOSTATS





8 FEATURES

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3. COMPLETE SELECTION OF TEMPERATURE RANGES AND SWITCH COMBINATIONS. Models to meet every requirement.
4. FAST REACTION TO LIQUID TEMPERATURE CHANGE. Two-inch well provides large heat-exchange area for direct and proximity contact with temperature-sensitive element.
5. CLOSE TEMPERATURE DIFFERENTIAL. Approximately 10° F. in most installation conditions.
6. TEMPERATURE SETTING EASILY CHANGED. Just one external adjustment screw to turn.
7. AMPLE CURRENT CAPACITY FOR USE IN ALL STANDING CONTROL SYSTEMS. Up to 15 Amp. switch rating.
8. MERCURY TYPE SWITCH. Dust-proof, tamper-proof, impervious to corrosive atmospheric conditions and "pitting" characteristics.

FOR COMPLETE SPECIFICATIONS REQUEST BULLETIN SDL-32R-2.

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.
Manufacturers of Automatic Pressure, Temperature and Flow Controls
BRANCH OFFICES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

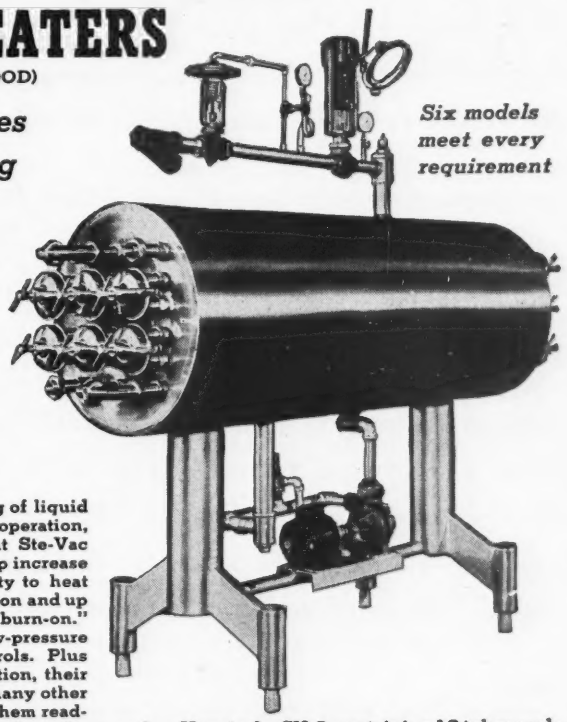
STE-VAC HEATERS

(FOR LIQUID FOOD)

High Temperatures
Sustained Heating
No "burn-on"

- 5,000 to 40,000 lbs. per hour capacity
- Quickly adapted to practically any liquid food heating operation

Six models meet every requirement



If high temperature processing of liquid foods is part of your plant operation, you'll want to know all about Ste-Vac Heaters and how they can help increase production. About their ability to heat up to 190° in one stage operation and up to 240° in two stages—without "burn-on." Plus their utilization of dry, low-pressure steam under self-acting controls. Plus their stainless steel construction, their ease of installation and the many other Ste-Vac features which make them readily adaptable to your plant and product, and assure you of maximum heating efficiency.

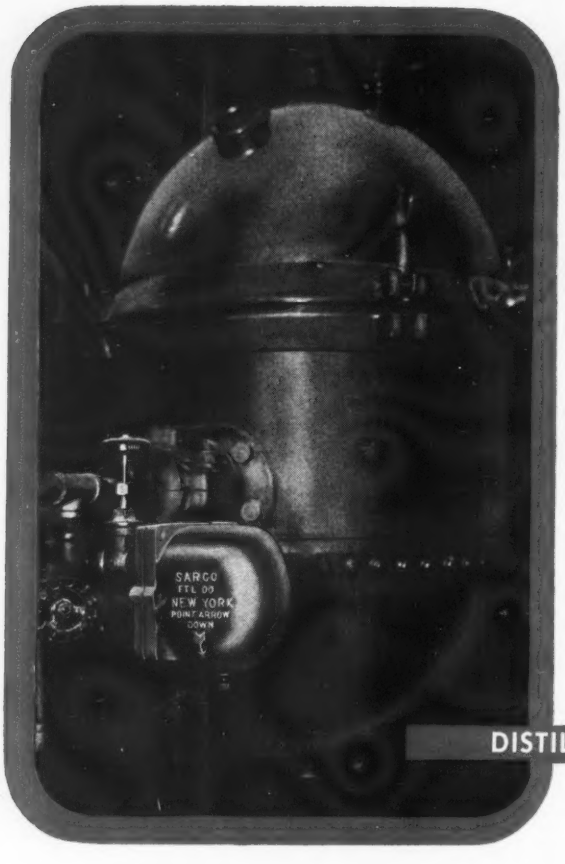
There's a Ste-Vac Heater for your particular needs. Write for detailed information and specifications.

Here is the SV-8, containing 18 tubes each 6' long. This heater can handle 6,000 pounds of liquid food per hour in heating from 40° to 190°. Floor space 2' by 8'. Shipping weight 2,000 pounds.

Designers and manufacturers of foods handling equipment since 1899.

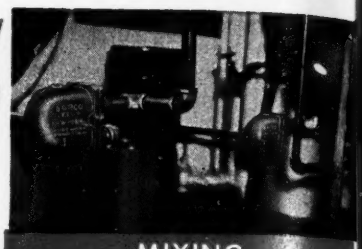
CHESTER DAIRY SUPPLY CO.

5TH AND TILGHMAN STREETS CHESTER, PA.

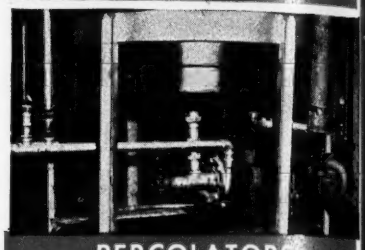


DISTILLATION

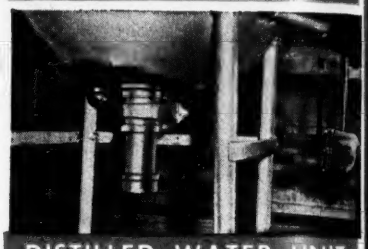
Flavors "FOR FOODS OF FAME"



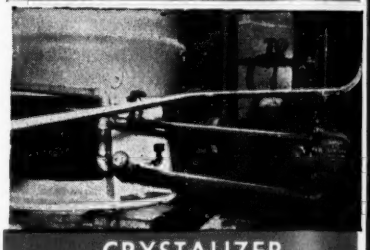
MIXING



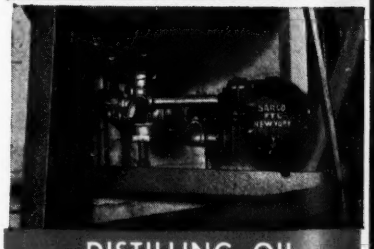
PERCOLATORS



DISTILLED WATER UNIT



CRYSTALIZER



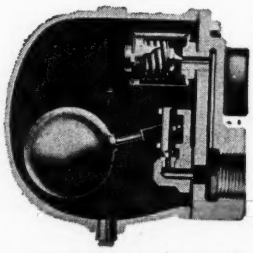
DISTILLING OIL

BLENDING

Every process requiring steam in the large flavoring plant of Food Materials Corporation, Chicago is provided with a Sarco Float-Thermostatic steam trap. The result is evidenced by the continuous, reliable production records and a quality output which faithfully reproduces the exact flavors originated in their extensive laboratories.

Wherever the cost of heat is a considerable proportion of the total cost of the product, it pays to put the right kind of steam trap on each coil and steam line. If temperatures must be held within a few degrees, it is comparatively inexpensive and easy to add Sarco Temperature Controls.

Information on the functions and uses of the various types of traps and control is given in the Sarco Catalogs sent on request. The nearest Sarco Representative will gladly cooperate in solving your individual process heating and cooling problems.



FLOAT-THERMOSTATIC STEAM TRAP

148

SARCO SAVES STEAM

SARCO COMPANY, INC.

Represented in Principal Cities

Empire State Building, New York 1, N. Y.

SARCO CANADA, LTD., TORONTO 5, ONTARIO

Changes in Food Supplies

(Indicators)

Raw Materials

Red cherry prospects were far below 1946, according to the compilation of the Red Cherry Institute. Total production was estimated at 139,500,000 lb., which compares with actual 1946 production of 218,000,000 lb.

Peach output was estimated at 89,183,000 bu., which compares with 86,643,000 bu. produced last year and a ten-year average of 63,000,000 bu. The quality is also unusually high.

Chicks produced during June totaled 87,007,000—30 percent more than the 66,779,000 produced during June, 1946, but 38 percent below the 1941-45 average June hatch of 140,497,000. There were 39 percent more eggs in incubators on July 1 this year than last.

Apple production estimates indicate a drop from 119,400,000 bu. last year, to approximately 111,000,000 bu., this year. Eastern states production was estimated at 38,785,000 bu., from 53,393,000 bu., last year. Central and Western states, however, were running above last year.

World output of fats, oils and oilseeds, in 1946, is estimated at 17,696,000 tons oil content, about 5 percent above the 1945 production, but about 20 percent below the 1935-39 average.

Production

Creamery production for June was estimated at 156,305,000 lb., an increase of 7 percent from May. This compares with a May-June increase of 5 percent last year, and five year average seasonal gain of 3 percent. Output was 29 percent greater than in June, 1946, but was 19 percent less than the five-year average.

American cheese production during June topped any other month on record. Estimated at 126,735,000 lb., production was up 6 percent from the previous month, 29 percent from June, 1946 and 22 percent from the five-year June average.

Fats and oils production, for the first half of 1947, was about 10 percent larger than production a year earlier. Output of federally inspected lard, tallow and creamery butter was up 16 to 33 percent. While cottonseed oil declined, output of peanut, corn and soybean oils increased to bring up the total.

Flour production in July came to 16,546,853 sacks, according to the Northwestern Miller. This is an increase of 386,383 sacks over the June output of the mills reporting.

Stocks and Storage

These stocks of canned vegetables were compiled by the National Canners Association:

Canned tomato juice stocks, which include cocktail and mixtures containing at least 70 percent tomato juice, held by canners on July 1, totaled 2,778,000 cases, basis 24/2's. These compare with June 1 stocks of 6,364,000 cases, and with 405,000 cases held on June 1, 1946. All stocks were not compiled on July 1, last year.

Canned sweet corn in canners' hands, July 1, were equivalent to 797,000 cases, basis 24/2's which compares with July 1, 1946 stocks of 380,000 cases.

Total frozen fish and shellfish holdings, on July 1, came to 90,600,000 lb., which compares with 97,806,263 lb., held July 1, 1946.

Freezer occupancy rose from 74 to 78 percent during June, and cooler occupancy went from 68 to 74 percent.

Indexes

The commodity price index on food, compiled by the New York Journal of Commerce, stood at 199.4 for the week ending August 9. This compares with 195.6 for the preceding week, 193.5 for July, and 157.6 for the month of August, 1946.

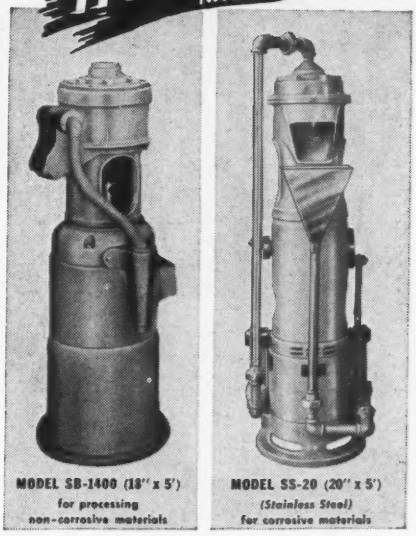
Business Week's index of business activity was 190.8 for the week ending August 2. For the previous week it stood at 190.2, the month before it was 186.0 and the preceding year it was 183.1.

CONSTRUCTION NEWS

	Pending (thousands)	Total Awarded—Aug. (thousands)	Total Awarded—1947 (thousands)
Bakery	$ 110	$160	$15,387
Beverages	1,507	55	13,466
Canning and Preserving	205	...	460
Cold Storage	970	189	2,633
Confectionery	805	...	514
Grain Mill Products	366	205	25,602
Ice, Manufactured.	145	...	205
Meats and Meat Products	555	60	4,866
Milk Products	1,765	400	5,830
Miscellaneous	1,324	65	13,117
	$7,752	$1,134	$82,080

SAVE up to 50% on MILL COSTS with

MOREHOUSE HY-R-SPEED MILLS



MODEL SB-1400 (18" x 5') for processing non-corrosive materials

MODEL SS-20 (20" x 5') (Stainless Steel) for corrosive materials

Multiply production—Improve quality—Save space

Now you can have processing equipment that is amazingly compact, versatile and efficient at half the cost of old style mills. Occupying only a fraction of the space required by ordinary units, these new Morehouse models produce several times as much—better and more efficiently. They are designed for use on a wide range of materials, both wet and dry. Adjustment is quick and easy, either for individual materials or methods of processing including

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The Morehouse high speed principle makes these revolutionary mills possible. Advanced engineering design and nearly half a century of experience in manufacturing quality products contribute to smooth, economical, dependable operation. Save money, save valuable space and improve both volume and quality with Morehouse HY-R-SPEED MILLS. Write for complete details.

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ENGINEERING LABORATORIES, INC.

What Washington Thinks

By R. S. McBRIDE, Washington, D. C.

RELIEF FOR THE NUTS—We refer literally to nuts, peanuts to be specific. Peanut growers are rightly worried that excessive production of quality nuts may break prices. Food executives may ask, "Why not? And if not, how do you expect to get big new peanut-product markets for oil, meal, and food specialties?"

FREIGHT INCREASE—Again the railroads are asking Interstate Commerce Commission for substantial increases in freight rates. If granted as asked, the industries of the country will find their freight bill is over $1,000,000,000 greater next year than this. Food executives must take this up-trend into account, even though officials probably will not grant the whole rate increase asked.

MR. CONGRESSMAN—Members of Congress are at home, busy mending fences and finding out what constituents want. This is the time for executives and technical men of the food business to talk with them about the problems that should be met in the next session. Perhaps most important of the messages which Congressmen should get this fall are those bearing on the relationship between raw materials and the cost of living. The legislators should be convinced of the basic fact that continuing support for agricultural prices will inevitably make food cost more for the housewife. It is important that these public officials learn how little mark-up occurs between the primary raw material and the products of food factories as they go to the wholesaler.

MODERNIZING—One of the oldest food arts of China is the manufacture of soy sauce. Modern food technology supplies a controlled equivalent made with known organisms under exact industrial conditions. One may even buy the essential components of this sauce as pure chemicals for flavor development in our processed foods. The Department of Agriculture has pedigreed organisms, including molds, yeast and bacteria, for the fermentation part of soy sauce making. Control of savor in food need no longer be only a household art that grandmothers pass along to daughters and granddaughters.

A GOOD RECORD—Congress went home this summer after accomplishing more legislative results than are usual in a single session. There appears to have been more genuine cooperation between the Capitol and the White House in getting rid of war time controls than anyone expected last winter. Washington does not expect any continuance of the political armistice—if one calls this year an armistice—for 1948 is a presidential election year. Much food industry activity will be influenced by legislation of next session. And frequently the political commotion attending legislative effort will be more disturbing than serious. Washington's actions are seldom as serious as Washington talk.

PRICE LAW WORKS—The price of honey goes up and down according to the supply in the market. Government officials are talking about this, complaining: "Demand for honey on the part of large buyers has been light, which has resulted in a rather marked decline in honey prices." One wonders whether these folks of Washington thought that they had repealed the law of supply and demand.

SWEDISH PATTERN—Commercial relations with various countries will, if Uncle Sam has his way, more or less follow the pattern of the recent trade understanding reached between our State Department and the Swedish government. This is the most definite indication which those interested in international trade can get of what our present government wants to do in trade regulations. Such understandings do not take the place of the formal trade agreements, which fix tariff rates, but they are much

CHANGE OF ADDRESS

DIRECTOR OF CIRCULATION, FOOD INDUSTRIES
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more important in some ways because they deal with prices, quotas, and trade controls other than tariff. International food movement will be governed widely by this sort of regulation, if the world remains sufficiently peaceful to permit any kind of understanding to operate.

A HUGE JOB—Water supply and sewage disposal is one of the biggest jobs to be done in this country. Some figures indicate that urban water supply is the largest single kind of business. This conclusion becomes believable when one studies the detailed summary of U. S. Public Health Service regarding needed public works for states, counties, and cities. These jobs alone, neglecting all industrial investment, will require $7,800,000,000 for completion. The Surgeon General says in this connection: "A sanitary environment for everyone is a basic requirement of a national health program. By furnishing data on the volume of construction needs, the survey will guide future action aimed at providing nationwide protection against filth-borne diseases."

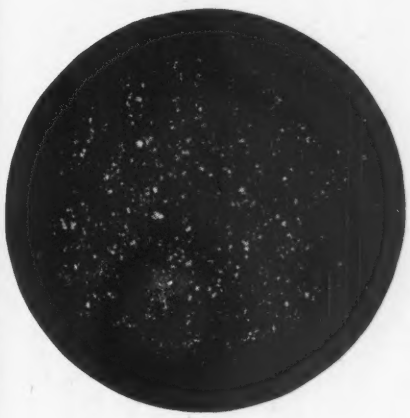
TAX POLICY—Comprehensive revision of the federal tax laws is planned. Hearings to discuss all features begin this fall. Income tax rates on business and individuals will be considered, but far more attention will be given to complete rewriting of excise tax and special tax laws. Food companies and their executives will find special interest in the possibility of reducing tax exemptions on cooperative enterprise when this is directly competitive with individually owned or corporate business. Some may wish to campaign for direct taxation on so-called "cooperatives" when most of the business done is not directly for and with bonafide members. Critics of the present law say that many organizations under the guise of cooperative ownership are getting unfair advantage of other business because they go far beyond the buying and selling for actual members. Congressmen should hear the views of all on any phase of the tax question so that legislation next winter can reflect the best opinion available.

NEW MARKET—Lard will keep longer without becoming rancid if it contains 4 to 6 percent by weight of hydrogenated vegetable shortening. Department of Agriculture investigators proved this in tests during the war period, but only now are pressing for use of the method. Their principal effort has been to get those doing home rendering of lard to use this means of keeping their product palatable longer. But it is obvious to a food man that in areas where lard does not always reach the housewife in the best condition, the use of a blended shortening of this sort might be very advantageous. Perhaps a "lard-base shortening" is the answer.

MONSANTO SODIUM BENZOATE, U.S.P.

flakes

powder



flakes do not dust or ball

In the food processing and bottling fields, both powder and flake forms of Monsanto Sodium Benzoate, U.S.P., are equally recognized for high product purity. However, flakes are frequently preferred because they do not lump or ball and therefore flow more freely and evenly than powder. This results in less dust, easier handling and blending for uniform results.

Try Monsanto Sodium Benzoate, U.S.P., flakes and see if you prefer them from a use standpoint. For comparative purposes, samples of both flakes and powder will be sent on request. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri . . . District Sales Offices: New York, Chicago, Boston, Detroit, Birmingham, Charlotte, Cleveland, Cincinnati, Los Angeles, San Francisco, Seattle. In Canada: Monsanto (Canada) Ltd., Montreal.

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Bone-Dry VODOL-... stabilizer and antioxidan... moisture that causes thickening ... chocolate coatings. Pour in VODOL-XX ... self how perfectly thinned, free flowing consi... maintained throughout! Unexcelled in ready dispersion ... fats. VODOL-XX is giving remarkable proof of its superiorities in Baking—Margarine—Packing Industry Products —wherever Lecithin is used.

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INDUSTRY

Bakers Association of the Carolinas recently elected J. J. Schopp, Ambrosia Cake Bakery, Greensboro, N. C., as its president. He succeeds Gregory Peeler.

Ben Gee Products, Inc., announces the opening of a new plant at Oak Lawn, Illinois, for processing its chow mein dinners. The factory is located on a ten acre farm where celery, onions, pimentos and mushrooms will be grown.

Ervan Lucas Bols, Inc., liqueur concern of Holland, will have its first American plant in Englewood, N. J. Scheduled for completion on Nov. 1, the plant will consist of a one and two-story building containing 24,000 sq. ft.

The Bridgford Co. has moved its general offices from San Diego to Los Angeles. M. E. Wangenheim, general manager, will be located there.

Carnation Milk Co. will begin construction in the fall of a $1,500,000 seven-story building in Los Angeles, to house a consolidation of its executive offices now located in Milwaukee, Seattle, New York and Los Angeles. The consolidation will include the offices of Albers Milling Co., a subsidiary, now in Seattle.

Caroline Products Co. plans to build a $400,000 milk processing plant at Seneca, Mo.

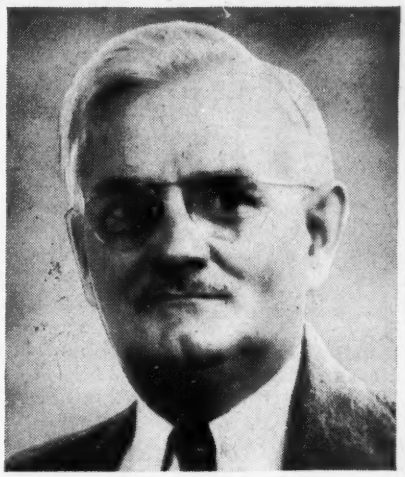
Chip Steaks, Inc., recently was incorporated at Milwaukee for the processing, sharp freezing and sale of thin steaks in Wisconsin and the upper peninsula of Michigan.

Durkee Famous Foods, Elmhurst, New York, is constructing a $400,000 addition to its present plant facilities.

Flavor Service, manufacturer of puddings and flavors and a division of the Ramson Corp., Chicago, has begun production in its new plant and will produce packaged bakery mixes for the newly-formed food company, Homart Foods, Chicago.

George A. Hormel & Co., Austin, Minn., has begun operations at its newly acquired plant at Fremont, Neb., formerly owned by the Fremont Packing Co.

The Imperial Salt Co., Blue Ridge, Tex., has been sold to R. T. Cowen, according to its three owners, Walter R. Smith, J. B. Turner and Cliff Matthews.



DR. H. A. MURRAY

DR. EDWIN L. SEXTON

Chief chemist and assistant plant manager of the Buffalo mill of The Best Foods, Inc., Dr. H. A. Murray has been appointed plant manager, succeeding V. B. McLean, who has retired. Dr. Edwin L. Sexton has been appointed chief chemist to succeed Dr. Murray.

Kraft Foods Co. is starting production operations in its new $400,000 cheese plant at Bentonville, Ark. Dedication ceremonies will be held when production reaches one-half carload of cheese daily.

McPhail Chocolates Corp., Chicago, has purchased Sierra Candy Co., San Francisco.

St. Martin Sugars, Inc., plant at Breaux Bridge, La., formerly known as Ruth Sugars, was destroyed by fire recently with a loss estimated between $250,000 and $300,000. A warehouse containing a large quantity of sugar, the machine shop and the plant's office building escaped the flames.

PERSONNEL

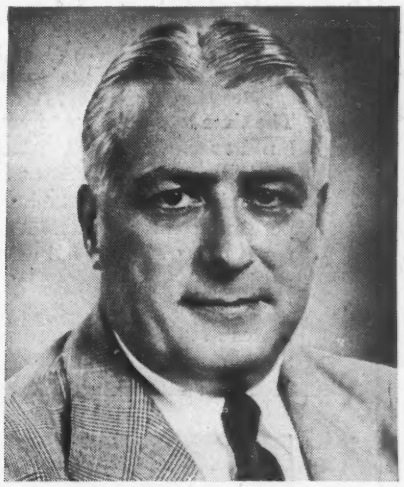
Page R. Boyles, formerly with General Foods Corp., is now with Sardik Food Products Corp., New York, as sales manager of the bulk pectin products division.

Dr. S. M. Cantor, formerly assistant director of research, Corn Products Refining Co., Chicago, has become director of research for American Sugar Refining Co., with headquarters in Philadelphia.

James R. Darnell has been made assistant to the president, Bjorksten Research Laboratories, Chicago.

J. A. DANAHER

Previously manager of the Chicago Bakery of Sunshine Biscuits, Inc., J. A. Danaher has been made manager of the Dayton Bakery, succeeding W. W. Paddon, who becomes general manufacturing manager in the New York offices.



SAMUEL A. ALTER

The appointment of Samuel A. Alter as manager of product development for The White Rock Corp., New York, recently was announced. Mr. Alter formerly was with Horlicks Malted Milk Corp., Racine, Wis., and prior to that was with Coco Cola Co.

CONVEYCO PACKER COUNTER COUNTS PRODUCTION *Automatically*

AN UP-TO-THE-MINUTE TALLY of production in your plant is always visible with the accurate Conveyco Packer Counter. Each employee's total shows on individual recorders and the total production of the entire plant is recorded on a totalizator.

TESTED IN VEGETABLE PACKING PLANTS and Food Processing Plants . . . the Conveyco Packer Counter has reduced overhead, eliminated errors in counting, and minimized personnel problems regarding piece-work pay.

JUST A TOUCH OF A BUTTON located at each work station counts completed units of work in plants using assembly line methods or where employees are paid on a piece-work basis.

TOTAL TALLY IS DOUBLE CHECKED by an automatic counting trigger which counts items as they leave processing or packing room.

LOW OPERATING COST . . . . Uses less electricity than a 60 Watt light bulb.

EASY TO INSTALL in any size plant with any number of employees.

Write for catalog sheet. Ask for names of plants where packer counters are in operation.

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The time to make sure of your insulation protection is before you build or expand. Get the facts on Cork insulation when they can do the most good. Cork is so efficient in insulating properties that its performance has long been the accepted standard for low temperature requirements. Its wide usage in the refrigeration industry is due to its proved record for more than 40 years. Mundet refrigeration engineers are experienced in all details of temperature control. Write to us now for recommendations and estimates . . . let us help you secure the most profitable use of low temperature. Mundet Cork Corporation, Insulation Division, 65 South 11th Street, Brooklyn 11, New York.

MUNDET CORK INSULATION

Peter A. Erben is now in charge of malt production for the Grace Enterprises, an organization with breweries in Sacramento, Los Angeles and Fresno, Calif. He formerly was with the First Carmel Malting Co., New Jersey.

A. T. Flynn, vice-president in charge of fruit and vegetable canning operations, Reid-Murdock & Co., Chicago, has been elected a director of Consolidated Grocers Corp., of which Reid-Murdock is a subsidiary.

Lowell O. Gill, formerly manager of the technical service department of A. E. Staley Manufacturing Co., Decatur, Ill., has been appointed assistant technical director of the company's research laboratories.

Dr. R. E. Greenfield, general superintendent of A. E. Staley Manufacturing Co., has been elected a director of the Decatur, Ill., corn and soybean processing company.

Ze'ev Halperin, former chief chemist of Petri Wine Co., has returned to America from a 9-months visit to Europe and Palestine.

Sam F. Hinkle, formerly chief chemist for Hershey Chocolate Corp., Hershey, Pa., is now plant manager and has charge of all factory operations and construction.

R. C. Huth of the Charles A. Krause Milling Co., Milwaukee, has been elected president of the American Corn Millers Federation.

John Joerg, formerly assistant to the late Conrad Buehl, has been appointed master brewer of the Ambrosia Brewing Co., Chicago.

Percy L. Julian, director of research, soya products division of The Glidden Co., Chicago, has been awarded the Spingarn Medal, presented annually by the National Association for the Advancement of Colored People, for distinguished achievement.

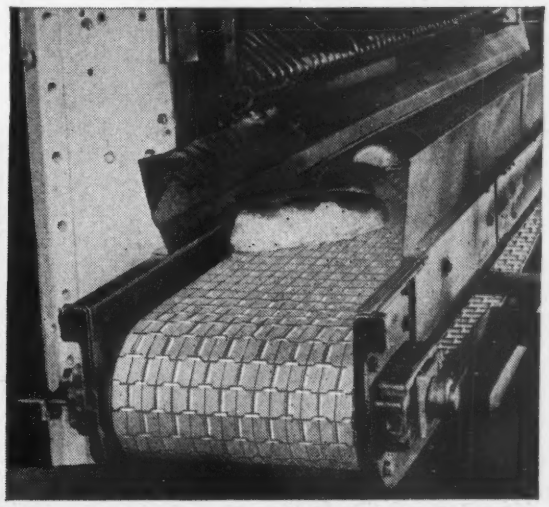
C. R. McKenna, Johnson Biscuit Co., Sioux City, Iowa, was elected president of the Biscuit and Cracker Manufacturers Association at its recent annual meeting. Other officers elected are: A. P. Streitmann, United Biscuit Co. of America, Hanford Main, Sunshine Biscuits, Inc., and G. H. Coppers, National Biscuit Co., all vice-presidents; and R. T. Stokes, secretary-treasurer.

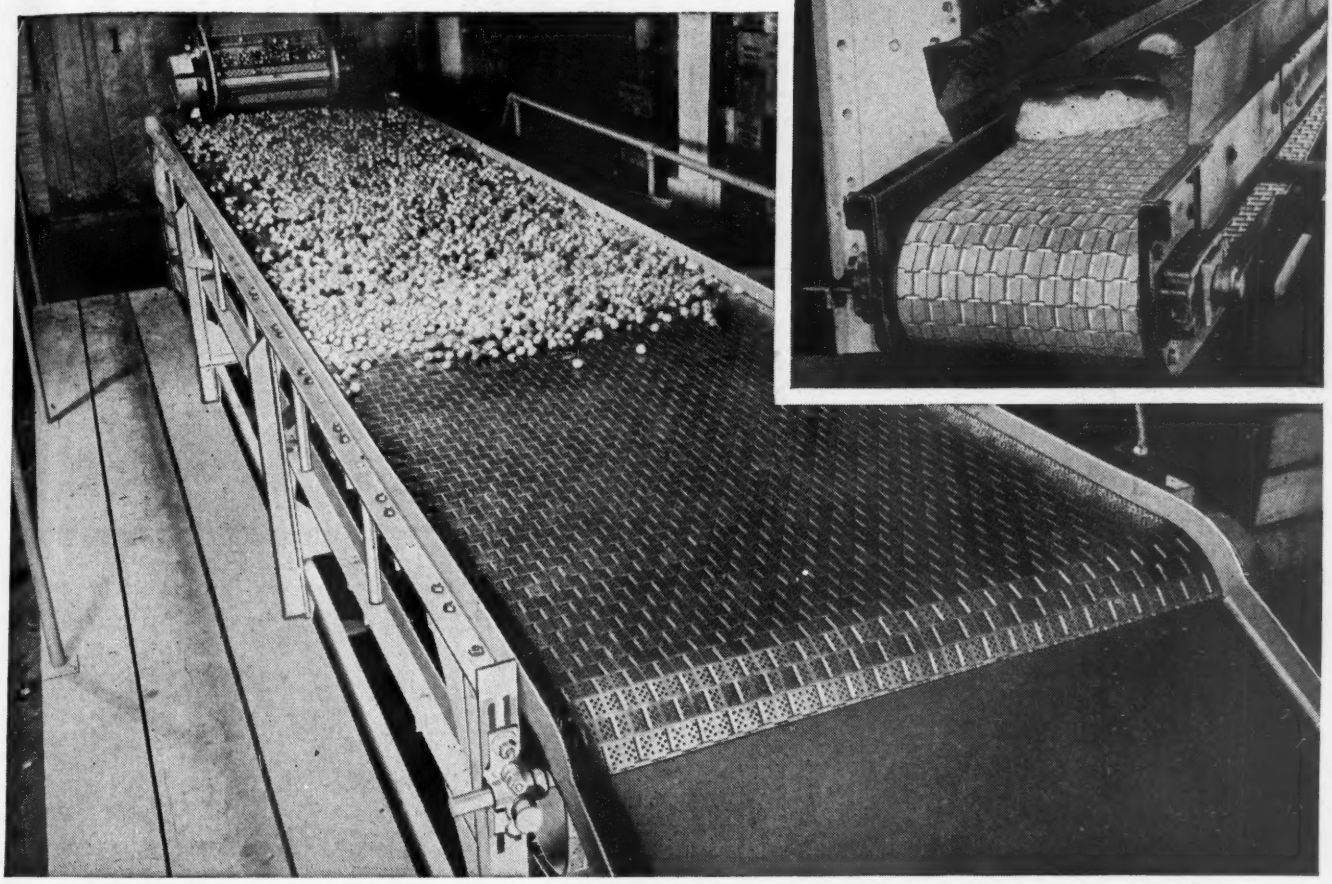
Joels Mitchell, vice-president in charge of the international division of Standard Brands, Inc., has been elected executive vice-president.

Walter S. Shafer has been elected vice-president and general sales manager of Armour and Co., Chicago, succeeding F. W. Specht who has be-

End Conveyor Belt Troubles with F M C FLAT TOP STEELBELT

At right — FMC Flat-top STEELBELT with solid-top links, as used by bakeries.
Below—FMC Flat-top STEELBELT with perforated links as used by canneries.





STAINLESS STEEL (or Electro Galvanized) Solid or Perforated

Here's a belt that meets the most exacting requirements of canners, packers, bakers, bottlers, and many other industries.

It smoothly conveys products between departments and through washing, drying, steaming, cooling, spraying, soaking, and various other processes.

Made from high quality cold rolled No. 302 (18-8) stainless steel, formed into specially designed links and joined with heavy gauge spindle wires. (Self-locking on the underside to form a continuous length.)

F M C Flat-top STEELBELT is easily cleaned, resists surface abrasion, is easily spliced, and is extremely flexible.

The Self-Locking feature is simplicity itself, so that belt can be lengthened or two sections joined quickly and easily.

Offered in any length and in widths in multiples of even inches.

Sign and send the coupon for sample section and full information.

FOOD MACHINERY CORPORATION

ANDERSON-BARNGROVER DIVISION • SAN JOSE, CALIFORNIA
SPRAGUE-SELLS DIVISION HOOPESTON, ILLINOIS

FOOD MACHINERY CORPORATION
Anderson-Barngrover Div.
San Jose, California
Sprague-Sells Div.
Hoopeston, Illinois

Please send me folder ● and sample of belting.

Company Name_____
Address_____
My Name_____
Title_____

for • SPRAYING
• WASHING
• RINSING
• COOLING
• AIR CONDITIONING

Get the most out of your Spraying Equipment with minimum power . . . with efficient spraying.

Use Yarway Nozzles. No internal vanes or other restrictions to clog or hinder flow. Two types—Yarway Involute-type producing a fine hollow spray with minimum energy loss, and Yarway Fan-type producing a flat fan-shaped spray with time-saving slicing action for cleaning.

Wide range of standard sizes and capacities. Cast or machined from solid bar stock.

Thousands in use. Write for new Bulletin N-616.

YARWAY SPRAY NOZZLES

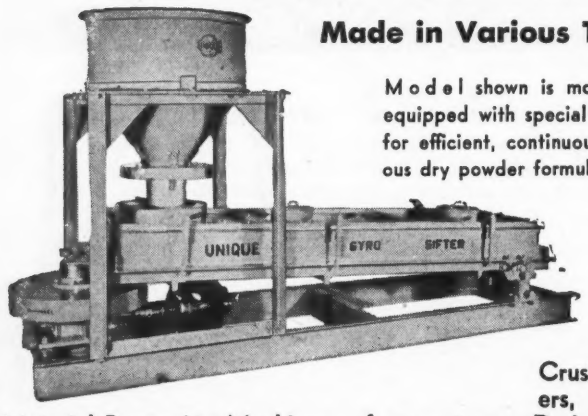
FAN-TYPE FOR FLAT SLICING SPRAY

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

ROBINSON
PROCESSING UNIQUE EQUIPMENT

GYRO-SIFTERS

Made in Various Types and Sizes



Model shown is motor-driven . . . equipped with special telescopic hopper for efficient, continuous feeding of various dry powder formulations.

Crushers, Grinders, Sifters, Attrition Mills . . . Material Processing Machinery of every type. Designed to your requirements by experienced engineers whose reputation is founded upon doing things right. Literature available. Inquiries invited.

ROBINSON MANUFACTURING CO.
Plant: Muncy, Pa.
SALES REPRESENTATIVE
MERCER-ROBINSON COMPANY, INC.
30 CHURCH ST., NEW YORK 7, N. Y.

come president. Mr. Shafer has been with the company for 25 years.

Clarence Wiesman, formerly head of the packaging pilot plant, Armour & Co., Chicago, is now director of development, chemical and research development department, in charge of pilot plant, packaging house, dairy and poultry development operations.

Dr. Frank J. Welch, dean of the School of Agriculture, Mississippi State College, has been named associate director of the Agricultural Experiment Station. He will continue as dean of the school but will be succeeded by Dr. D. Gray Miley in the agricultural economics department.

C. W. Wolfe, Meggs Macaroni Co., Harrisburg, Pa., was re-elected president of the National Macaroni Manufacturers Association.

Dr. J. G. Woodruff, Georgia Agricultural Experiment Station, has been elected chairman of the Georgia Section of the American Society of Refrigerating Engineers. Other officers include: C. P. Goree, The Frick Company; E. L. Gunn, American Service Co., and C. T. Baker, consulting engineer.

DEATHS

Garth Carrier, vice-president and general manager, Iowa Canning Co., Vinton, Iowa, July 14.

Ernest D. Collins, 70, plant manager, American Fruit Growers, at Yakima, Wash., recently.

Franklin M. Crosby, 72, director and vice-president, General Mills, Inc., Minneapolis, recently.

Daniel J. Kenney, 57, retired candy manufacturer, Seattle, recently.

John A. Lane, 58, vice-president and comptroller, Armour and Co., Chicago, recently.

M. H. Mann, 60, president and general manager of Red Lodge Canning Co., Red Lodge, Mont., Billings, Mont. recently.

W. L. Maxson, 49, founder and president of the W. L. Maxson Corp., New York, and founder of the method by which whole meals could be cooked and then quick-frozen, recently, at Boston.

Edward T. Murphy, 62, former owner of the Wilmington Packing Co., Woburn, Mass., recently.

Edward T. Poor, 62, secretary-treasurer of the Canner Publishing Co., Chicago, recently.

New GMCs

BETTER LOOKING!

BETTER RIDING!

BETTER BUILT!

THE LAST WORD IN
CAB COMFORT

There's comfort galore in the cab of a new light or medium duty GMC! It's all-steel . . . wider and longer . . . completely insulated and soundproofed. Its adjustable seat has 73 individually wrapped springs . . . heavy upholstery and padding. Its windshield is higher and wider . . . visibility greater all around. Its unique ventilation system provides circulating fresh air . . . heat if desired. Dome light, ash tray and sealed-on handles are three of its many finer appointments.

Out front, there's added protection with rugged bumper bar grille, frame-mounted and angle braced. Under the hood, there's war-proved, improved power with engines of "Army Workhorse" design. Under the load there's solid strength with heavier axles and frame. And overall, there's a complete range of chassis and body types with a smartly styled model for your job.

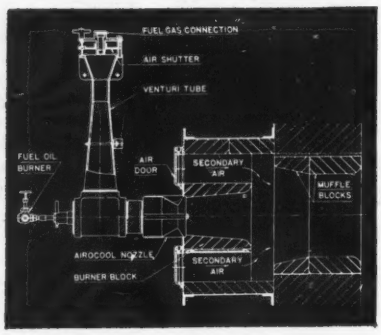
GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

THE TRUCK OF VALUE — GMC TRUCKS — GASOLINE • DIESEL

NATIONAL AIROIL FUEL OIL · GAS BURNERS

TANDEM COMBUSTION UNIT

CAN BE BROUGHT QUICKLY TO FULL CAPACITY WITH A CLEAN FLAME



and is easily "lighted-off" in a cold furnace . . . with fuel oil or gas. It maintains a high flame temperature with either fuel oil or gas; has a high turndown ratio with a steady flame; and can be applied to all types of boilers and process furnaces. The flame can be regulated and directed to uniformly radiate heat to the absorbing surfaces without flame impingement. This unit is also designed to fire vertically upwards and under forced draft preheated air when necessary. Write for further information.

NATIONAL AIROIL BURNER CO., INC.

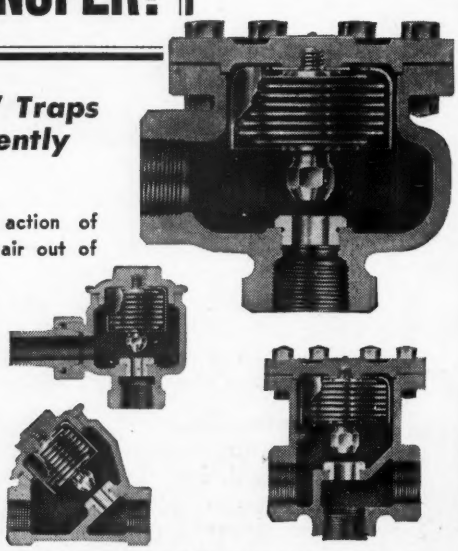
Main Offices & Factory: 1272 EAST SEDGLEY AVENUE, PHILADELPHIA 34, PA.
Texas Office: 2nd National Bank Bldg., Houston

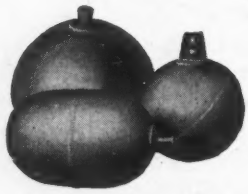
INDUSTRIAL OIL BURNERS, GAS BURNERS, FURNACE EQUIPMENT

DOES AIR SLOW UP YOUR HEAT TRANSFER?

Nicholson "Fast Action" Traps Discharge Air as Efficiently as Water

The positive, frequent intermittent action of Nicholson steam traps tends to pull air out of the system to the trap, where it is readily eliminated, speeding heat transfer. Installations result in production increases up to 30%.





Nicholson is one of America's largest makers of welded floats for operating mechanisms and as H. P. storage vessels. All sizes and shapes. Bulletin 746.

5 TYPES FOR EVERY APPLICATION—process, power, heat. Size 1/4" to 2"; pressures to 225 lbs. Bulletin 544 or Sweet's.

W. H. NICHOLSON & CO.
193 OREGON ST., WILKES-BARRE, PA.
Valves • Traps • Steam Specialties

ASSOCIATED INDUSTRIES

Aluminum Seal Co., subsidiary of Aluminum Company of America, has appointed Norman Olsen as sales manager, with headquarters at the company's home office in Richmond, Ind.

Lester Kehoe Machinery Corp., New York, dealer of used machinery for milk, ice cream and other food processing industries, has announced the purchase of a new warehouse on Staten Island, N. Y.

Warren F. Keller, basic industries department, Allis-Chalmers Mfg. Co., Milwaukee, has been named milling engineer of the grain and chemical processing section, basic industries department, succeeding W. C. Mander, who has retired.

Liquid Carbonic Corporation's new $1,500,000 factory in Chicago, when it is completed this fall, will give the company an increase of approximately 50 percent in capacity for the manufacture of soda fountain and luncheonette equipment.

Marathon Corp., Menasha, Wis., has established six regional sales offices and has appointed six regional sales managers to be in charge of them. The offices are in New York, Atlanta, Ga.; Cleveland, Ohio; Chicago, Kansas City, Mo., and San Francisco.

Monsanto Chemical Co. has appointed Richard D. Dunlop as technical director in charge of research and development of the company's Texas division at Texas City.

Pneumatic Scale Corp., Ltd., North Quincy, Mass., has elected Wallace E. Coughlin as vice-president in charge of the New York branch office. Mr. Coughlin is considered as an authority on the practical use of automatic machinery in the packaging and bottling industries.

H. K. Porter Co., Inc., Pittsburgh, has announced the promotion of Harold A. Hintz to Pacific Coast sales manager. Mr. Hintz will direct the activities of all Porter sales offices on the coast and will maintain headquarters in Los Angeles.

Western Crown Cork & Seal Corp., a wholly-owned subsidiary of Crown Cork & Seal Co., Inc., has commenced construction of its new San Francisco factory on a 33-acre site. Construction is expected to be completed by April 1, 1948, and the new plant is estimated to cost approximately $2,000,000, including land, building and equipment.

2 out of 3 are filled OUTSIDE

More than 2 out of 3 market baskets in eleven Western States are filled outside the 6 largest cities. They are filled at Hometown food stores, for Hometown tables, by Hometown housewives.

These housewives read the Hometown Daily Newspaper. They make up their shopping lists from its advertising pages. No seller of food-stuffs can afford to present a blank page to these important buyers.

Yet he does just that, unless his newspaper advertising appears in the Hometown Daily Newspaper. And, what goes for food goes for a lot of other things these families use. Because the whole family reads this favorite daily paper, believes in it, and buys from it.

Over 90% of the 5,687,000 total circulation of all daily newspapers in the eleven Western States is confined to the city and the retail trading zones in which they are published.

Your Hometown Daily Newspaper is more carefully read, by more members of each family, than any other advertising medium, and its readers believe in it.

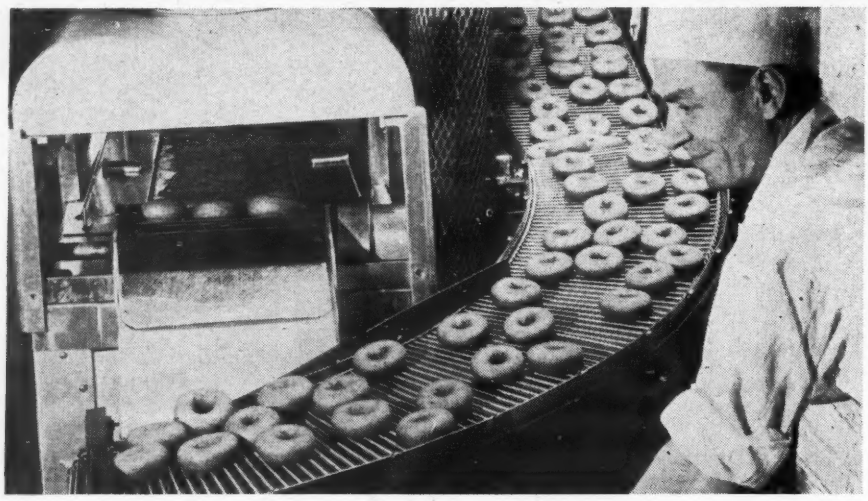
THIS WESTERN HOMETOWN MARKET IS AMERICA'S THIRD GREATEST SALES AREA

Only THE HOMETOWN DAILY NEWSPAPER covers this Primary Market

For complete information write to

Hometown Daily Newspaper Publishers— 625 Market Street, San Francisco 5, California

FOOD EQUIPMENT NEWS



Conveyor Belt Turns Corners, Cools Product 1

COOLING belt lines of a baking plant may be designed to hug the walls, turn as many corners as necessary, and to stack flights to ceiling heights with as little as 10 in. between loaded faces, by the use of a steel grid conveyor belt designed by Cyclone Fence Div. of U. S. Steel Corp., Dept. I, Waukegan, Ill. Its open construction permits the air circulation required for cooling a light-weight product while in motion. Made in bright, galvanized tinned or stainless steel wire. There are no lubrication problems and because steel wire is used, no difficulties result from fats, oils, greases, fumes or heat. Belts are assembled to meet the needs of the individual user's design, taking into consideration such problems as service life, speed of transfer, weight, power required to operate and slippage. As the belt is assembled from individual straight, stiff wires, it is possible to compensate wear factors by replacing one or more links at a time. The belt is made from No. 9 gage steel wire assembled on ½ in. centers in standard widths, from 6 in. to 2 ft. in straight or curved sections.

Motor Controllers 2

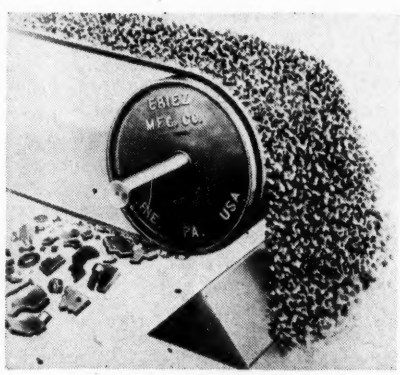
A SERIES of 1 hp. controllers, designed for medium industrial or work shop equipment, available in 4 switching arrangements: Reversing, 2-speed, series-parallel, and 3-pole Off-On, is announced by Furnas Electric Co., Dept. I, Batavia, Ill. It has a plastic case, handle and contact rotor. Several mounting arrangements are available such as an angle bracket, flange mounting plates and plates for attachment to several styles of standard outlet boxes.

Revolving Heater 3

A REVOLVING unit heater, in which the fan is driven by a steam turbine, thus using the same steam to operate the fan and to heat the air, is announced by L. J. Wing Mfg. Co., Dept. I, 154 W. 14th St., New York 11, N. Y. Electric meter and electric power are eliminated. Temperature of condensate is never above 170 deg. F. and can be returned to the boiler through an open return system. Revolving discharge distributes heat in constantly changing direction. Made in three sizes with capacities of 2,700, 4,020, and 5,620 cfm. with a temperature rise of 45 deg. F.

Improved Check Valve 4

A LINE of check valves embodying no metallic operating parts to stick, slam, chatter or leak, available in sizes from ½ to 12 in., is made by Grove Regulator Co., Dept. I, Oakland, Calif. An outstanding feature is the tough flexible tubular operating member, of synthetic rubber, tapering down to a sensitive operating lip. The degree to which it opens or closes is in direct ratio to flow volume. As it reaches shut-off position, flow velocity increases to flush the seating surface of any small particle. The resiliency of the flexible tube completely absorbs any and all shock impulses.



Magnetized Pulley 5

A COMPLETELY self-energized magnetic pulley, adaptable to all food applications requiring automatic separation of magnetic from non-magnetic materials conveyed on a belt, is now being produced by the Eriez Mfg. Co., Dept. I, Erie, Pa.

Powered by giant Eriez Alnico alloy magnets that require no electric current to generate a magnetic field, these pulleys may be placed in locations where extreme operating conditions preclude the use of electrically powered magnetic apparatus. They will work effectively through belts of rubber, canvas, leather, or any other non-magnetic material, and are not affected by moisture, heat or cold.

WRITE FOR MORE INFORMATION

Food Industries Reader Service now makes it easy for you to follow up the news on new equipment and new materials. Tear-out coupon cards are supplied for your convenience on the special colored page which follows the equipment news section in this month's issue. Enter your requests, fill out and mail cards, and let Reader Service do the rest.

Industrial Apron 6

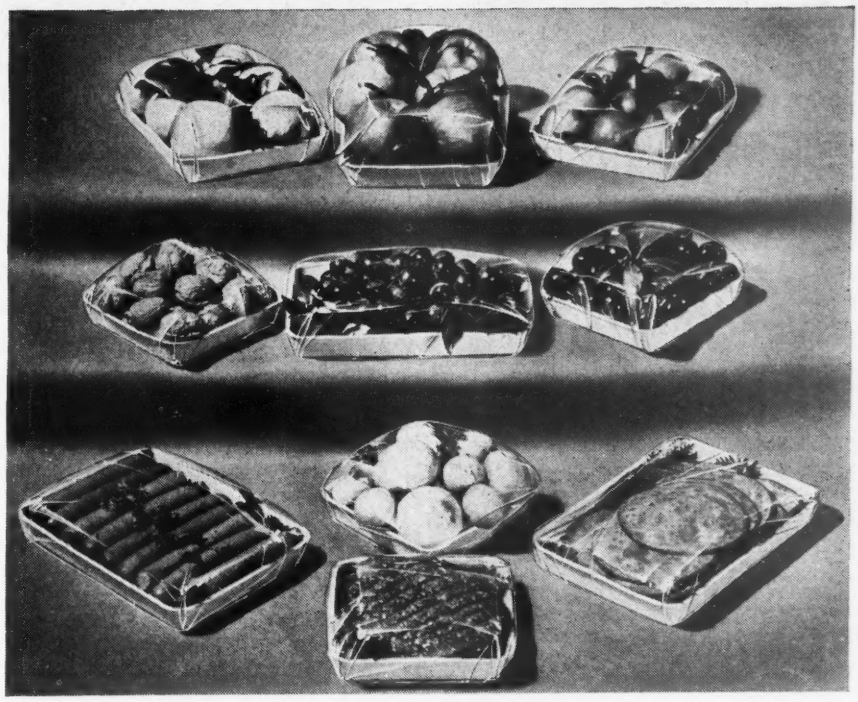
A NEW lightweight, easy to wear industrial apron made of Koroseal film is announced by The B. F. Goodrich Co., Dept. I., Akron, O. The clear, transparent film is resistant to acids, greases, oils, caustics, animal and vegetable fats, butter fats, blood, sol vent and soaps, and will not become stiff or tacky. It can be sterilized in a disinfecting solution. Made in two sizes: 29 x 35 in. with tape and hem, weighing 3 oz.; and 35 x 45 in. with tape, hem and grommets, weighing 5 oz.

Small Engine 7

DESIGNED for simple low-cost maintenance, and to eliminate the long costly delays usually involved in low horsepower gasoline engine repair work, a new light-weight 2 hp. engine is produced by the Scott Engine Co., Dept. I, 1 N. LaSalle St., Chicago 1, Ill. An integrally cast crankcase housing and cylinder block of aluminum is the principal weight saving feature. The 2¼ in. flatheaded aluminum piston has a 2¼ in. stroke. Facilitating quick repair, complete replacement heads will be stocked by dealers for exchange at low cost. Other features are replaceable valve guides, a replaceable cast iron cylinder liner and a greatly simplified arrangement for valve adjustment.

Flush Mount Tachometer 8

A TACHOMETER indicator for flush mounting on switchboards is announced by Metron Instrument Co., Dept. I, Denver 9, Colo. Total projection is only ¾ in. from the panel surface. It is supplied in any one of 50 standard scales covering speeds from 1 to 100,000 rpm. It can be equipped with a rotary selector switch so that any number of tachometer heads can be used with a single indicator to monitor speeds of several machines from a centralized location. Dimensions 7½ in. wide, 9¾ in. high, with a projection of 4⅝ in. behind the front surface.

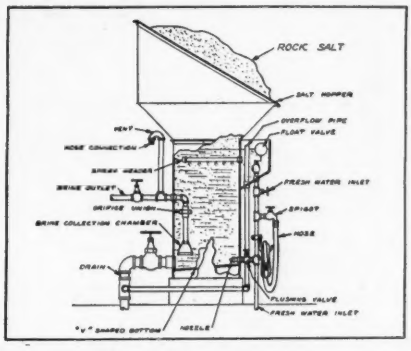


Low-Walled Tray Improves Product Visibility 9

A NEW, low-walled, molded, virgin pulp food tray, which may be used in automatic packaging machinery and which greatly increases visibility of Cellophane-wrapped fruits, vegetables and meats, has been introduced by B-F-D Co., Dept. I, New York 17, N. Y. Now available in two sizes: 8x5½x1 in. and 5x5x1 in. The trays stack well for display and will not transmit odors or discolor contents. Additional sizes will follow demand.

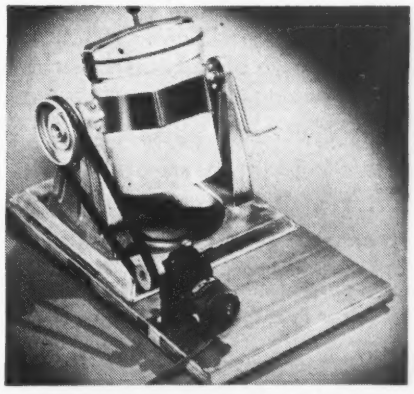
Thermometer 10

To eliminate the necessity of returning thermometers to the factory for repair, a separable socket industrial thermometer—the Senior Midget—has been developed by the Accuracy Scientific Instrument Co., Dept. I, Philadelphia, Pa. The thermometer is available in angle and straight stem types with heavy armor protection to resist corrosion and dirt, and is equipped with flat bore mercury stripe in a yellow column for easy reading.



Brine from Rock Salt 11

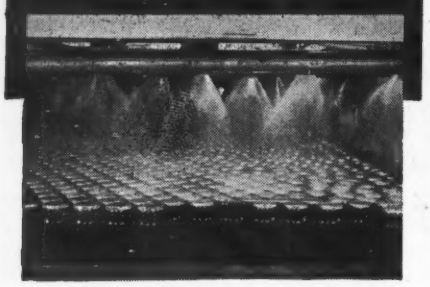
THE Brinolator, a salt dissolver which automatically produces a fully saturated, clear, filtered, clean and pure brine from rock salt, is supplied by the Carey Salt Co., Dept. I, Hutchinson, Kan., in sizes capable of producing from 500 to 10,000 gal. per day. Brine is obtained by a combined method of dissolving rock salt without agitation and through self filtration. Two special features are: The float valve arrangement that controls fresh water inlet and brine flow; and the clean out feature.



Motor-Driven Tumble Jar 12

A GLAZED chemical tumble jar, 6 in. in diameter by 8 in. high, powered by a gear reduction motor to rotate at a speed of 55 rpm, is announced by Andrew Technical Service, Dept. I, Chicago, Ill. The jar has a reinforced rim and stoneware cover held tightly against the soft rubber gasket by a metal clamp. It can be used for blending or mixing liquids or solids, and owing to the heavy weight of the glazed jar it can also be used as a ball mill.

Get
POSITIVE AUTOMATIC CONTROL OF PASTEURIZATION
with the VORTEX

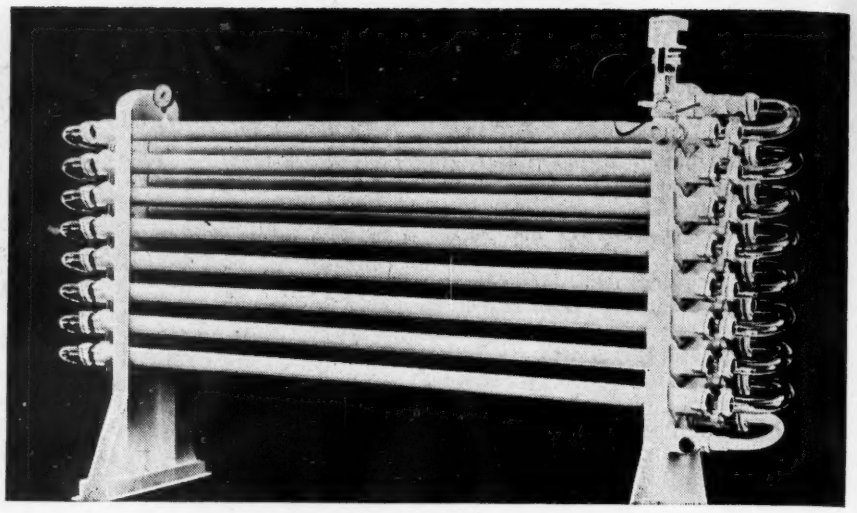


Vortex pasteurizers assure positive, accurate control of temperature and time, plus the advantage of completely automatic operation.

Thermal transfer is achieved through the medium of atomized water sprays, and temperature zones are designed with careful attention to heat reclamation so that consumption of steam is as economical as possible. Other design features include the patented "walking beam" conveyor, smooth hydraulic drive and a complete absence of gears, cams or chains.

Years of complete satisfaction are certain because of the durability of the design and measures taken to eliminate corrosion. It will pay you to get all the facts about the advantages of VORTEX machines for either pasteurization or cooling of foods. Send us your requirements and write for new technical bulletin.

BARRY-WEHMILLER MACHINERY CO.
1946 . . . Our 61st Anniversary
St. Louis, Mo., U. S. A.

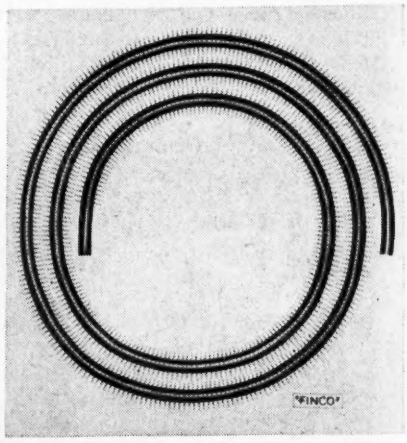


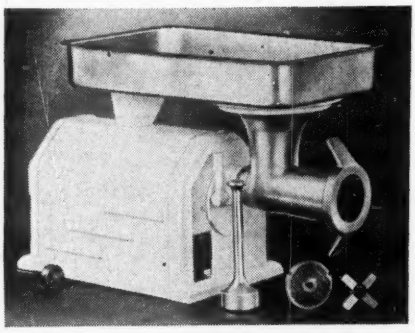
Glass-Tubed Heat Exchanger and Pasteurizer 13

VALLEY FOUNDRY & MACHINE WORKS, INC., Dept. I, Fresno, Calif., is building a glass-tubed heat exchanger designed to offer greater sanitation to the wine and food processing industries. The unit is of tube-in-tube design with special Pyrex glass tubing used for the inner tubes and return bends. A steel outer jacket is used for either live steam or hot water. Capacities range from 200 to 3,000 g.p.hr. Heat ranges up to 200 deg. F. The unit is provided with self-operating steam temperature control, thermometer and pressure gage. Casters available on portable units.

Folding Conveyor 14

A NEW gravity conveyor that folds up to a convenient 10-ft. length, is easily moved from one operation to another, and quickly adjusted for height and incline to meet different requirements, has just been introduced by Wilkie Co., Dept. I, 5520 Arch St., Philadelphia, Pa. It comes in three sizes, 10 to 20 ft., 10 to 30 ft., and 10 to 40 ft., has a frame construction of ½x1½x3/16 channel iron, and ball-bearing skate wheels. It has 3-in. castors and a pressure brake lock to hold the conveyor firm while in use.





Meat Chopper 15

REGAL MFG. CO., Dept. I, South Gate, Calif., is making a new, heavy duty, 32-head meat chopper equipped with a 1½ hp. motor for 2,000 lb. per hr. capacity, or 1 hp. motor for 1,300 lb. per hour. Base is rubber cushioned to absorb vibration. Included as standard equipment are a 6 ft. rubber cord and plug for 220 volt, single phase, 60 cycle service; aluminum stomper; two knives; one No. 32 plate with ⅛ in. holes, and one No. 32 plate with 3/16 in. holes.

Coiled Finned Tubing 16

COILED finned tubing of the recently developed serrated fin type is now available for general industrial use under the trade name of "Finco," by Fintube Coil Corp., Dept. I, Alhambra, Calif. Utilizing a new bending technic, flat or pancake coils are formed out of tubing with serrated fins as high as ⅝ in. without crushing or distorting the fins.

New Fiberglas Cloth 17

MADE from fibrous glass yarn having a weave similar to that of cheesecloth, a new reinforcing fabric for the roofing trade is marketed by Western Fiberglas Supply Ltd., Dept. I, San Francisco, Calif. The new product is said to be many times stronger than cotton cloth, lighter in weight and easier to handle, and does not need to be impregnated with asphalt or pitch products before using.

Do your wrappers have these advantages?

Patapar has them ALL

WET-STRENGTH:

With Patapar* Vegetable Parchment you get a wrapper that can take any amount of wetting and like it. Patapar stays intact and strong even when boiled.

When moist foods are wrapped in it, Patapar gives lasting protection.

GREASE-PROOFNESS:

When Patapar comes in contact with grease, fats or oils it resists penetration. Products like butter, bacon, shortening, fish are kept fresh in it.

NO ODOR:

Patapar is pure of texture. Has no odor. It doesn't cause "off" flavor in foods.

NO TASTE:

Patapar doesn't impart a "papery" taste to things that are wrapped in it. It's tasteless.

BEAUTIFUL PRINTING:

Patapar wrappers can be printed beautifully with brand names and colorful designs. We do the printing in our own plants which are specially equipped for printing Patapar economically in one or more colors.

*Reg. U. S. Pat. Off.

Here's something else you get when you use Patapar

When you order printed Patapar we'll include the Keymark at no extra cost. The Patapar Keymark is the nationally advertised symbol of wrapper protection. When women see it on a wrapper it reminds them the product inside is well protected.

Paterson Parchment Paper Company • Bristol, Pennsylvania

Headquarters for Vegetable Parchment Since 1885

WEST COAST PLANT: 340 BRYANT STREET, SAN FRANCISCO 7, CALIFORNIA

BRANCH OFFICES: 120 BROADWAY, NEW YORK 5, N. Y. • 111 WEST WASHINGTON ST., CHICAGO 2, ILL.

Basco-TEX

PLASTIC APRONS

Will Not Crack or Peel

POSITIVE PROTECTION against WATER, OIL, ACIDS, ALKALIES

NO LAUNDERING *Just wipe off with a damp cloth. A tremendous cost saver.*

PRICES—COLORS—SIZES

WHITE—
4 Mill Plastic
27 x 36..$ 6.62 per doz.
30 x 36.. 7.53 per doz.
36 x 40.. 7.98 per doz.
36 x 44.. 8.85 per doz.
Full Length Sleeves $6.00 per doz. pair

BLACK or WHITE —8 Mill Plastic
27 x 36..$ 9.00 per doz.
30 x 36... 9.75 per doz.
36 x 40.. 11.15 per doz.
36 x 44.. 12.85 per doz.
Full Length Sleeves $10.65 per doz. pair
Leggins, Hip Length $13.10 per doz. pair

MAROON—Heavy Doubled Coated Neoprene
27 x 36..$12.50 per doz.
30 x 36.. 14.00 per doz.
36 x 40.. 18.35 per doz.
36 x 44.. 20.50 per doz.
Full Length Sleeves $12.00 per doz. pair
Leggings, Hip Length $23.00 per doz. pair

BLACK—
12 Mill Plastic
27 x 36..$10.25 per doz.
30 x 36.. 11.15 per doz.
36 x 40.. 14.25 per doz.
36 x 44.. 15.80 per doz.

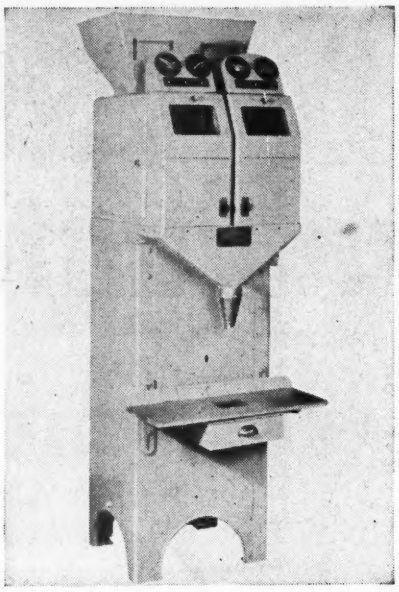
BLACK — Heavy Double Coated Neoprene
27 x 36..$12.90 per doz.
30 x 40.. 14.00 per doz.
36 x 40.. 18.35 per doz.
36 x 44.. 20.50 per doz.
Full Length Sleeves $12.90 per doz. pair
Leggins, Hip Length $25.50 per doz. pair

BLACK or WHITE —Extra Heavy 20 Mill Plastic
27 x 36..$14.20 per doz.
30 x 36.. 15.90 per doz.
36 x 40.. 20.15 per doz.
36 x 45.. 22.60 per doz.
Full Length Sleeves $14.25 per doz. pair
Leggings, Hip Length $25.75 per doz. pair

ALL PRICES F.O.B. CHICAGO
Minimum order 1 dozen.
ORDER BY MAIL OR PHONE TODAY
Free Sample Swatch on Request

All CLOTH APRONS Now Available
Write for Samples and Prices.

ASSOCIATED BAG & APRON CO.
218 West Ontario St., Chicago 10, Ill.
Phone SUPerior 5809



Semi-Automatic Filler 18

A SEMI-AUTOMATIC machine that weighs and fills dry products into any style container, at the rate of 20 to 30 per min. with one operator, is announced by Triangle Package Machinery Co., Dept. I, Chicago 51, Ill. The bulk material feeds, by parallel electric vibrating trays, from the overhead hopper to rotary buckets. One tray cuts off at a predetermined amount and permits the remaining tray to bring the weight to extreme accuracy before the bucket dispenses the charge to the filling spout. Machine can be furnished with various spouts for filling bags, cartons or cans, and with additional scales for higher production.

Thermostatic Traps 20

SARCO CO., INC., Dept. I, New York 17, N. Y., is now making cast-steel thermostatic steam traps to operate with pressures to 300 psi. or with superheat. The thermostatic element is a patented helical bellows which permits a much larger orifice than can be provided on float or bucket traps. The greater air venting capacity provides rapid heating from a cold start. The flexible bellows is the only working part. When installed to discharge to the atmosphere, no protection is required against freezing.

Sandwich Maker 21

MACHINES for making peanut butter, and other similar sandwiches, at speeds up to 96 per min., and wrapping them into groups of 3, 4 or 5 in heat-sealing Cellophane are made by Miller Wrapping & Sealing Machine Co., Dept. I, Chicago 6, Ill. Crackers are placed on the intake chain of the sandwich maker and are carried through the machine in two parallel rows. Peanut butter is deposited on the crackers in one row and the crackers from the other row are dropped upon them. Finished sandwiches pass under a light pressure roller which brings them down to uniform thickness. They are ejected onto a belt conveyor leading to the automatic wrapper. An operator picks up the sandwiches in the number desired for each package and places them on the intake of the wrapping machine. They are then automatically wrapped with two small sheets of heat-sealing Cellophane and deposited on a conveyor.

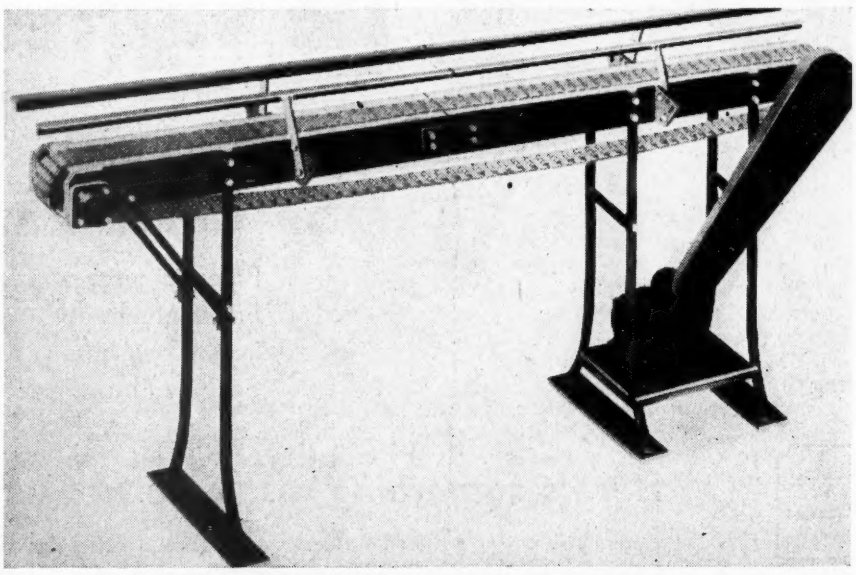
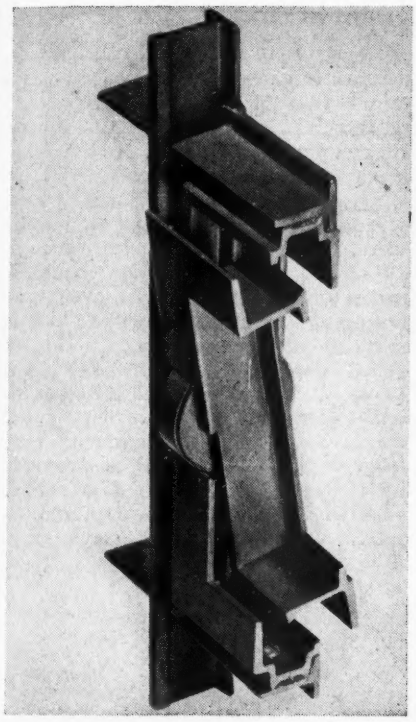


Table Top Package and Bottle Conveyor 19

A TABLE top conveyor for handling cans, bottles, jars and cartons, that can be furnished in any desired length, is announced by the Horne Machinery Co. Inc., Dept. I, 1188 Harrison St., San Francisco 3, Calif. It has several exclusive engineering features such as a renewable liner under the table top conveyor belt and complete adjustability from 1 to 7 in. for variations in widths of package. Built in 5 and 10 ft. sections.

Abrasive Cement 22

A NEW abrasive cement especially designed for permanently eliminating slipping and tripping hazards on worn stairways and uneven floors has been developed by Duane Specialties, Ltd., Dept. I, Newark, N. J. This cement, known as Duracite, comes in a dry powder form, and is made into mortar by adding plain water. The mortar is easily applied with a trowel. It will form a perfect bond with such difficult bases as slate, marble, concrete and wood, even when applied to a feather-edge of only 1/16 in. It will support walking traffic 6 to 8 hrs. after installation and will attain a granite-like hardness when fully set.



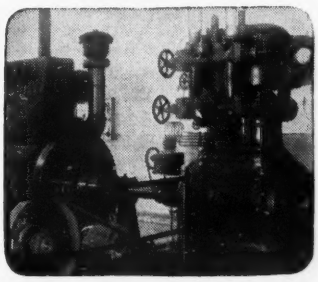
Steel Factory Sash 23

STEEL factory sash, for use wherever there are special requirements for sanitation or weather-tightness, and in industrial areas that create difficult conditions of maintenance, are announced by Hope's Windows, Inc., Dept. I, Jamestown, N. Y. Vertical sash bars are bulb tee sections with the flat tee horizontal muntins threaded through them. The weight of the section is heavier and the strength of the joint is double that of conventional sash. Sash are Bonderized and finished with a baked-on coat of rust inhibiting primer.

Plug Gate Valve 24

CRANE Co., Dept. I, 836 S. Michigan Ave., Chicago 5, Ill., announces a new line of corrosion-resistant plug gate valves which combine the advantages of the two most important basic types of valves. They provide straight-through flow in the wide-open position yet are suitable for throttling

Home Economics Department, Thomasville Ice & Mfg. Co.



One of Five Frick Refrigerating Machines in Service at Thomasville.

How This COMMUNITY REFRIGERATION CENTER Serves Southcentral Georgia

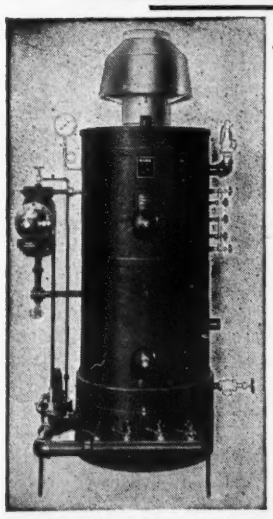
The Thomasville Ice and Mfg. Co. produces 130 tons of ice daily, ices many railway cars and trucks; stores great quantities of pecans, one-half million pounds of peanuts, quantities of pimento peppers, blueberries, pears, okra, potatoes, seed corn, tung oil nuts, and lupin seeds; rents 475 frozen-food lockers; conducts home economics demonstrations; will soon install bulk quick-freezers.

Its two plants at Thomasville give Southern Georgia and Northern Florida an invaluable service.

This firm has used Frick refrigerating and ice-making equipment exclusively for 35 years.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

CLEAN STEAM
AT CONTROLLED TEMPERATURE



The KANE Boiler is built, in sizes 1 to 30 H.P., to A.S.M.E. specifications for operating pressures up to 100 lbs. Special boilers for higher pressures built to order.

. . . the Automatic Gas-fired
KANE BOILER

Compact, self-contained, and "tailor-made" for your job . . . includes: the study and solution of your problem; the correctly sized and constructed KANE Automatic, Gas-Fired Boiler; the M-K-O Automatic Boiler-Feed to provide a constant water level for highest boiler efficiency.

Although orders cannot be filled immediately, we'll try to fill your urgent needs as soon as possible.

The M-K-O Automatic Boiler Feed returns condensate and supplies small quantities of hot water as needed to the KANE Boiler.

MEARS-KANE-OFELDT INC.
1903-1915 EAST HAGERT STREET, PHILADELPHIA 25, PA.
FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE.

Regardless of whether your process is Canning, Freezing, Dehydrating, or Pickling or you pack in tin, glass, cellophane, fiber, paper or wood, or ship wood or fiberboard, La Porte Conveyor Belting will save you time and labor and minimize spoilage. There are no sharp edges to injure workers . . . no fabric to harbor germs . . . and its rugged flexible construction withstands impacts at the loading chute. In addition, it will not creep, weave nor jump on pulley stand.

The open mesh feature permits the circulation of air, steam and heat around products in process and facilitates cleaning with steam gun or scalding water. Heat, cold and acid resistant.

Ask your Supplier Today. Available in any length and practically any width.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

★ Guardians OF THE NATION'S FOODS

DETROIT
1448 WABASH AVE.
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UNITED STATES COLD STORAGE

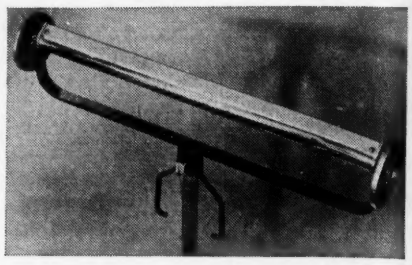
Four Modern Fortresses For Guarding The Nation's Foods

DALLAS
1114 WOOD STREET
ZONE 2

WRITE FOR DETAILS

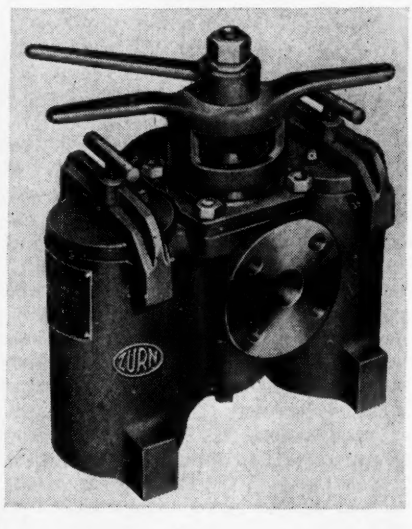
KANSAS CITY
500 EAST THIRD ST.
ZONE 6

service, like conventional globe valves. Of outside-screw-and-yoke design, the valves have bolted bonnet joints and are available with either screwed or flanged ends in sizes from ½ to 2 in. They are regularly furnished in either 18-8 Mo. or monel metal.



18-Inch Floor Magnet 25

A POWERFUL, wheel-mounted floor magnet for keeping bakery floors and tables free of iron and steel fragments, has been developed by the G. H. Tennant Co., Dept. I, Minneapolis, Minn. The unit will instantly pick up steel dust, chips, shavings, wires, screws, cuttings and other dangerous metal particles. It is low enough (3½ in.) to use under benches, around mixers, wash racks, ovens and wrapping machinery. The handle may be removed so magnet can be rolled directly over tables or bake pans. It can also be used inside of mixers, ovens or other equipment where loose ferrous fragments may lodge. Magnetic power is provided by 9 powerful Alnico magnet units encased in a heavy gage aluminum tube. When in use, magnet surface is ¾ in. above the floor.



Duplex Strainer 26

FOR installation in pipe lines where continuous flow is imperative, J. A. Zurn Mfg. Co., Dept. I, Erie, Pa., has developed a new type twin sediment strainer. It operates by means of a single plug type valve whose orifices direct flow from the inlet to either basket, or to both simultaneously. A relieving yoke seats the plug tightly

for sealing or to loosen it for turning. Plug action is non-freezing. Made in bronze, steel, semi-steel or special alloys, in sizes from 1 to 6 in.

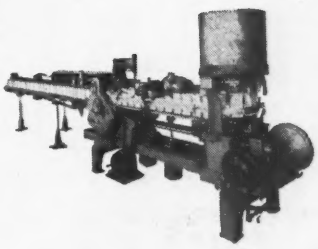
Pits and Halves Peaches 27

VASTLY increased production and savings in labor are obtained with the new Boutell freestone peach pitter and halver now being produced by the Boutell Mfg. Co., Dept. I, Rochester 6, N. Y. Fruit is manually fed into two cups which operate alternately, one being fed as the other is in motion. The cups, constructed in two halves, travel upwards through an arc of over 90 deg. The peach is carried through the slicing knives which cut into the flesh following the contour of the pit. The cup opens and, by a device in its bottom, separates the two halves of the peach from the pit. Halves and pits are discharged separately. Size of machine: 27 in. wide by 27 in. deep, with legs adjustable to any desired height. Driven by ⅓ hp. motor.

Area Meter 28

AN electronically-operated area meter developed by Bailey Meter Co., Dept. I, Cleveland 10, Ohio, is said to measure accurately the more viscous as well as freer flowing liquids. It consists of a specially designed telemetering transmitter connected to a standard Bailey electronic receiver. The transmitter is easily installed in the pipe line, much like a valve. It has a port area varied by a plug restrained with a calibrating weight or spring. The plug assumes a position proportional to the rate of flow. It is directly connected to the soft iron core of the telemeter transmitter and any movement of the plug causes a voltage ratio variation in the telemeter circuit. This variation is transmitted to the receiver, which may be an indicator, recorder and/or controller.

A



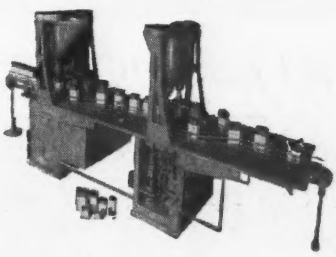
B

A—S & S Universal Filler

B—S & S Neverstop Carton Filler and Sealer

C—S & S Automatic 4 Station Filler

D—S & S Automatic Tight Wrapper



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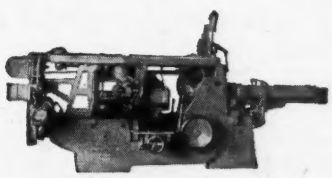


D

Well-known products from milady's powder, tangy spices, tasty puddings or powdered soap, all filled on S & S packaging machines. Bottles and cans, odd shapes, boxes or bags, there's an S & S packaging machine with speeds to suit your needs. Our engineering staff is always available to help in the solution of *your* problems.

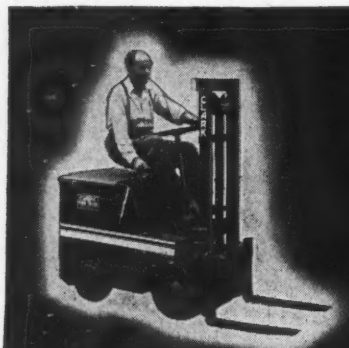
STOKES & SMITH Co

PACKAGING MACHINERY — PAPER BOX MACHINERY

4911 Summerdale Ave., Philadelphia 24, U. S. A.

FILLING : PACKAGING : WRAPPING MACHINES

CLARK *Electric Fork Trucks cost less!*



. . BECAUSE OF ECONOMIES RESULTING FROM MASS PRODUCTION OF MAJOR UNITS IN CLARK'S OWN PLANTS—ASSEMBLY-LINE PRODUCTION OF FORK TRUCKS, BOTH ELECTRIC AND GAS-POWERED—MAXIMUM INTERCHANGEABILITY BETWEEN GAS AND ELECTRIC MACHINES OF LIFT MECHANISMS, AXLES, WHEELS AND MANY OTHER PARTS.

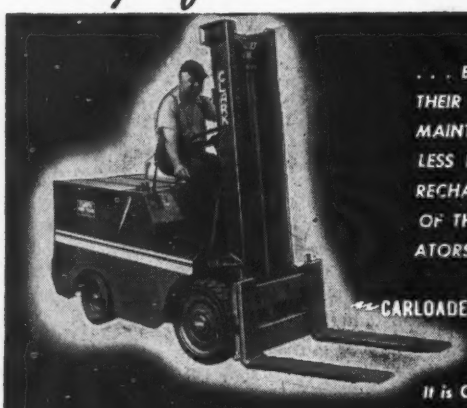
TRUCLOADER—CAPACITY 1,000 lbs.

CLARK *Electric Fork Trucks are unexcelled!*

...BECAUSE OF IMPORTANT CLARK-PIONEERED DEVELOPMENTS IN ALL MODELS—AMONG THEM: COMPLETE HYDRAULIC LIFT SYSTEMS—36-VOLT DRIVE MOTORS—COMFORTABLE SEATS FOR DRIVERS—AUTOMOTIVE TYPE CONTROLS AND STEERING—4 SPEEDS FORWARD, AND REVERSE—BATTERY CAPACITIES RICH IN RESERVE POWER—UPRIGHTS FORMED FROM STEEL PLATE.

CLIPPER—CAPACITY 2,000 lbs.

Users prefer CLARK *Electric Fork Trucks!*



. . . BECAUSE THEIR INITIAL COST IS LOW—THEIR OPERATING COST IS LOW—THEIR MAINTENANCE COST IS LOW—THEY CONSUME LESS POWER AND DO MORE WORK BEFORE RECHARGING IS NECESSARY . . . AND BECAUSE OF THEIR EASE OF OPERATION, MOST OPERATORS PREFER THEM.

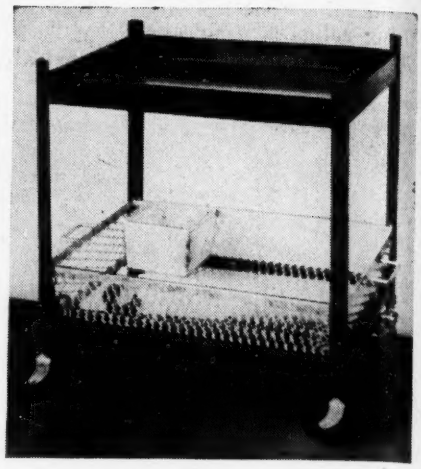
CARLOADER—CAPACITY 4,000-5,000 lbs.

It is CLARK'S business to know and to give YOU the answers to materials handling problems . . . Talk to CLARK! Talk Electric-Power; talk Gas Power—Clark's recommendations are unbiased because CLARK makes BOTH—and BOTH are the BEST that are made.

UTILITRUC—CAPACITY 6,000-7,000 lbs.

CLARK
Electric
FORK TRUCKS

CLARK EQUIPMENT COMPANY
TRUCTRACTOR DIVISION, BATTLE CREEK, MICHIGAN
OTHER PLANTS—BUCHANAN, JACKSON, BERRIEN SPRINGS, MICHIGAN



Cleaning Basket 29

A HANDY, 4-wheel dolly for carrying parts to the wash rack has been introduced by Homestead Valve Mfg. Co., Dept. I, Coraopolis, Pa. Mounted on 4-in. full swivel, hard composition wheels, the Clean-Tote, as it is called, is made in two models. One features an interchangeable, 2-deck dolly with a shallow metal tray and a specially designed wire mesh cleaning basket with an auxiliary fine mesh basket for handling small parts. The other model consists of the same expanded metal basket mounted on the same type wheels. A detachable "U" draw bar permits the dolly to be pulled or pushed without stooping.

Aluminum Ladder 30

THE ALUMINUM LADDER CO., Dept. I, Worthington, Pa., announces a new featherweight model aluminum ladder, economically designed for light industrial, home and farm uses. It weighs slightly over 1 lb. per ft., and is safe for a 250 lb. load. Will not rot or rust, and can be washed or scalded frequently without impairing its strength. Rungs are corrugated for safe footing. Sizes range from 6 to 16 ft. lengths, and two of the 8, 10 or 12 ft. lengths can be joined to form an extension ladder.

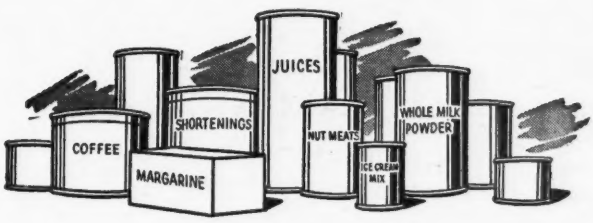
Steel Pallet 31

STEEL pallets, designed to cut down shipping costs through light weight and to reduce handling costs through eight-way lift utility, have been introduced by the Monroe Auto Equipment Co., Dept. I, Monroe, Mich. Design permits the forks of a lift or pallet truck to be slipped between the top and bottom sections from 8 different directions—4 sides and 4 corners. Top and bottom sections are held together by 9 hollow steel posts, crimped to hold the unit together without welding. This permits the use of stakes, which can be fitted into the hollow steel posts at the corners and sides. The bottom has 4 open sections so that it may be used with pallet trucks. Available in 6 sizes, the pallet will hold up to 20,000 lb. of boxed or bagged materials.

Linde

NITROGEN

HIGH-PURITY—99.99% PURE



Quality Packed They stay that way because they are processed and packed with LINDE High-Purity Nitrogen.

LINDE Nitrogen, 99.99% pure, is available in many locations—in any quantity. It is supplied in tank-truck and tank-car lots as a liquid which is converted to gaseous nitrogen as required, or as a compressed gas in 224 cu. ft. cylinders.

Let us show you, through Linde's Engineering Service, how you can protect the quality of your product by using LINDE High-Purity Nitrogen in manufacturing, shipping, and packaging. Just call or write any Linde office.

THE WORD *Linde* IS A TRADE-MARK

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

Crimpy
The Buffalo Wire Cloth Man
Gets Tinned!

I PUT ON A COAT OF TIN
. . . right over my steel wire before I'm woven, to take on separating, sorting and cleaning jobs with flour, chemicals, powders, seeds and foods.

BRING ON THE FOOD! I'M NON-CONTAMINATING

My coating is pure tin . . . and smooth as silk. Oh, that's not all! I resist humidity . . .

BUT MY MIND ISN'T ALWAYS ON FOOD!

I'm fast . . . can take quite a bit of abrasion, as you can see!

PEOPLE FIND ME EASY TO WORK WITH!

Want to form me? Go ahead! Easy? You bet- unroll me and I'm always flat and straight- don't draw like other cloths.

I'M ATTRACTIVE PRICE-WISE TOO!

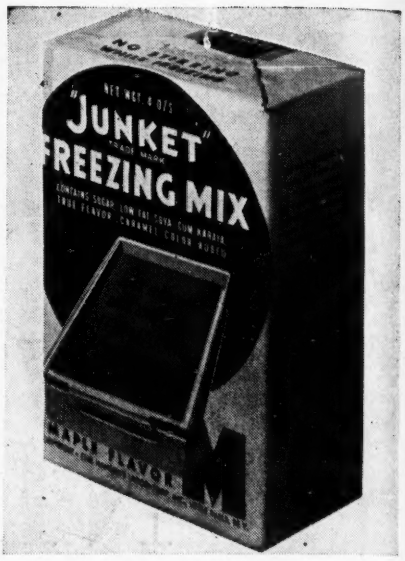
I've the economy of steel with only the small difference for my tin coating. But it's that coating which improves separation by filling my pores!

"BUFFALO" TINNED WIRE CLOTH

Woven in a large range of square meshes; available in rolls or cut pieces; made into reel covers; furnished with hook strips or webbing.

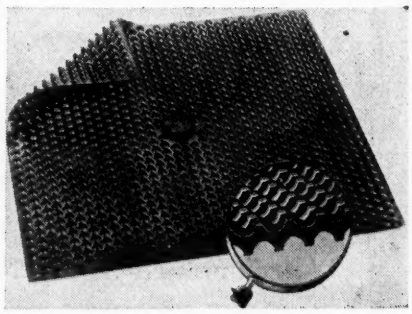
Buffalo WIRE WORKS CO., INC.
Manufacturer of All Kinds of Wire Cloth Since 1869

452 TERRACE BUFFALO 2, N. Y.



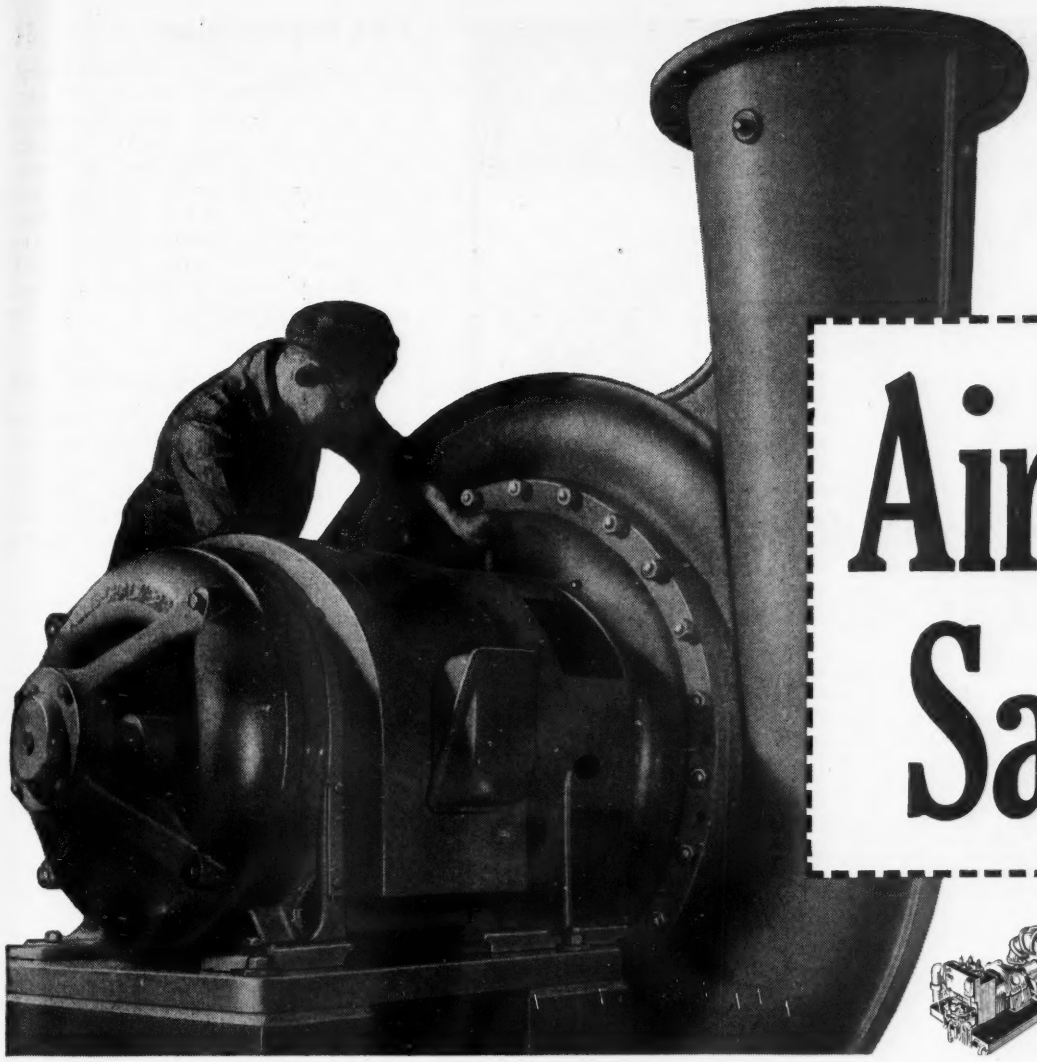
Overwrap Wax-Sealed 32

DESIGNED to take full advantage of the latest developments in moisture-protective papers, The Battle Creek Bread Wrapping Machine Co., Dept. I, Battle Creek, Mich., is offering the Model 33-G wrapping machine which adds to the overwrap a complete moisture-proof barrier by stenciling amorphous wax into the corner of the folds on each package end and on the bottom seam. All points on the fold that might be avenues for the transmission of air or moisture are sealed off through the patented method of applying additional wax to the end folds. The machine handles 65 to 80 cartons per min. when fed from an automatic conveyor. It carries out all the operations of cutting the paper, registering, stenciling and sealing it with a smooth continuous flow action.



Rubber Floor Mat 33

SCIENTIFICALLY designed for use where persons stand on their feet for long periods of time, Magic Mat, a unique rubber mat, has recently been introduced by Avenue Mfg. & Sales Co., Dept. I, Chicago, Ill. Consisting of over 2,000, ¼-in. high rubber cones which cushion the feet, this black non-marking mat is 21¼ in. square. Its overall thickness is 11/16 in. with a center layer thickness of 3/16 in. Cones on both sides give longer life and elevation from damp floors to prevent electrical ground shocks. Non-skid feature promotes safety.



Air for Sale!

AIR OR GAS IN MOTION, WORKING FOR YOU AT LOW COST AND PEAK EFFICIENCY IS WHAT ALLIS-CHALMERS BLOWERS OFFER YOU!

YES, AIR IS FREE — but air *handling* is not. Actually, the degree of efficiency of the handling equipment is what, in the final analysis, determines the *net cost* of air or gas to you!

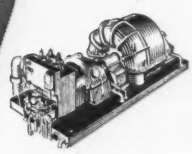
And this is of *major* importance, especially in the Chemical and Food Industries, where such equipment must be *pre-engineered* to handle highly technical processes.

Allis-Chalmers builds single and multi-stage turbo blowers as well as rotary compressors to meet practically all pressure and capacity requirements. A typical single stage blower is shown above. Use of cast casing provides rigidity, longer life, smoother operation, deadens machine noises and eliminates vibration. Operates on two bearings only . . . saves coupling and space. For higher pressures and larger volume, see multi-stage blowers at right.

Allis-Chalmers in conjunction with process engineers has developed air and gas handling equipment to suit special process applications. It offers more than fifty years of experience in this field and in building high-speed machinery. Result: we can provide you with the blower *you* need, either standard or special.

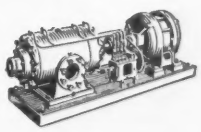
A qualified engineer is available in our nearby office to discuss how you can handle air or gas at *lower cost*. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

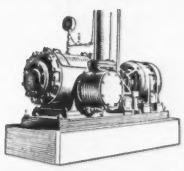
A 2248



← MULTI STAGE BLOWERS. Inlet volumes up to 130,000 cfm, pressure to 35 lbs gauge, uncooled. Pressure volume curve favorable to parallel operation.

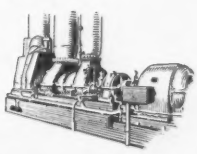
→ ROTARY COMPRESSORS, sliding vane type. Capacities for 5 to 35 psi-g. Air is compressed in cells formed by blades moving freely in and out of longitudinal slots in rotor.





← DRY VACUUM PUMPS. Range to 28½ inches hg vacuum. Same principle as rotary compressors except that inlet is hooked up to chamber to be evacuated and exhaust is open.

→ AXIAL COMPRESSORS. Compress to 60 lbs. gauge with high efficiencies. *Good base load machines. Used with gas turbines.* Cannot build up dangerous pressures.



← GET THE FACTS! Allis-Chalmers bulletin B6211 covers Rotary compressors and Vacuum Pumps — B6048 Single Stage Turbo Blowers — B6104 Multi Stage units. Write for them.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

IT TAKES ONLY ONE MAN
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To "ANCHOR" the "Streamliner Jr." in any desired location . . . just "flip" the "Diamond Caster" base.

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PORTABLE BELT BOOSTER

An hydraulic hoist—an exclusive feature conveniently located and easily operated by one man—quickly lifts or lowers the unit as needed . . . saves manpower . . . speeds materials handling. The *"Streamliner Jr."* is of sturdy welded construction . . . has "Diamond Casters" for maximum mobility . . . can be "anchored" in any desired position by simply "flipping" the caster base. Positive locking of the booster bed prevents "slip-back." For full details, write

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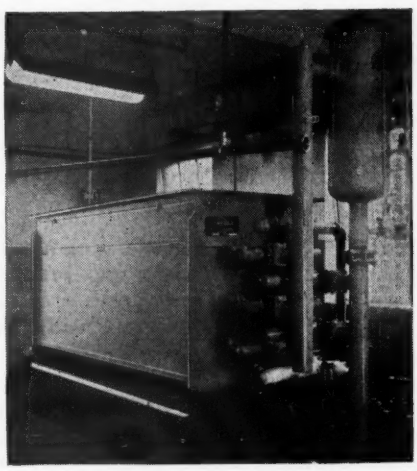
NIAGARA LIQUID COOLER Gives High Capacity in Small Space

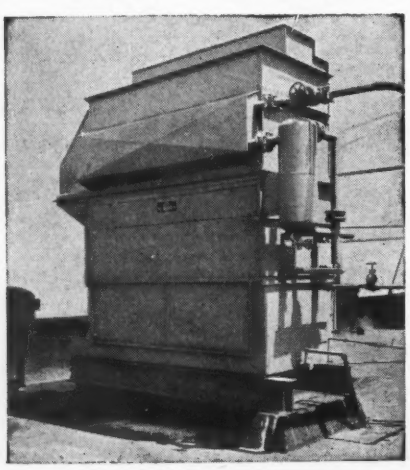
Cold water, chilled to 33° F., or cold liquids, or non-freezing solutions below 32° F. are produced economically by the new Niagara Liquid Cooler.

For large capacity equipment it is most compact. For example, one model furnishes 92 G. P. M. of water cooled from 45° F. to 35° F., with 28° F. refrigerant, in less than 30 sq. ft. of floor space. Other models . . . 24 to 465 G. P. M.

Extra advantages positive temperature control; assurance of holding temperature accurately in spite of variation in cooling load; rapid chilling of liquid; savings in power and refrigeration.

Write for Bulletin No. 100-FI.





NIAGARA Aeropass CONDENSER

. . . increases plant capacity for refrigeration users, saves power, saves condenser water. "Duo-Pass" (patented) reduces condensing temperature, prevents scaling and clogging of condenser tubes. "Oilout" (patented) removes oil and dirt from refrigerant, assuring full capacity.

Write for Bulletins 91-FI and 103-FI

NIAGARA BLOWER COMPANY

"30 Years of Service in Industrial Air Engineering"

405 Lexington Ave., New York 17, N. Y.

Field Engineering Offices in Principal Cities

Fire Extinguisher 34

A FOAM extinguisher, similar, except for carrying straps, to the type carried on fire engines, that produces a chemical foam equal to 10 times its own capacity, is announced by American-LaFrance-Foamite Corp., Dept. I, Elmira, N. Y. It has a seated stopper construction which prevents chemicals from mixing until needed. A twist of the wrist releases the seal and the extinguisher is ready for action.

Belt Conveyor Take-Up 35

A NEW light weight belt conveyor take-up that has exceptional strength and is self-lubricating is announced by Patron Transmission Co., Dept. I, New York 13, N. Y. Sizes range from 15/16 to 1-5/16 in. Take-up travel is 6 inches.

Cast Aluminum Lavatory 36

A LAVATORY that allows elbow washing by including a goose-neck soap dispenser and high spray head mounted 18 in. above rim of bowl is made by LeFiell Mfg. Co., Dept. I, Los Angeles, Calif. The unit is made of corrosion-resisting aluminum alloy. Hot and cold water may be operated individually or in mixture by conveniently placed foot pedals. To eliminate exterior plumbing connections, P-trap and clean out plug are combined in the aluminum base. Shipping weight 75 lbs..

CATALOGS, BULLETINS

This digest of manufacturers' new publications is offered by FOOD INDUSTRIES Reader Service as a convenience for executives. The editors feature catalogs, data sheets and technical pamphlets likely to interest purchasing agents, superintendents, packaging men and food technologists.

Food Plant Equipment

Industrial Filter 51

The Titeflex filter, which features simplicity of operation with ease of cleaning, is illustrated and described in a folder just published by Titeflex, Inc. Also illustrated and described is the Titeflex stainless laboratory filter.

Color Sorters 52

Bickley Mfg. Co.—10-page brochure on photoelectric air sorters. Describes, with illustrations, the operation of the Bickley color sorters. Contains data sheet and application diagrams for bean and rice sorting.

Vacuum Distillation 53

Distillation Products, Inc.—16-page, 2-color, illustrated booklet, "Information on High Vacuum Distillation," describes this company's process of molecular distillation and its laboratory stills.

Pumps 54

Oliver United Filters, Inc. — 6-page illustrated folder on "Olivite" the efficient and durable pump for handling hot or cold acids and corrosive solutions.

Humidifiers 55

Maid-O'-Mist, Inc., 4-page folder on 900 Series air-operated humidifiers for commercial and industrial applications. Contains engineering data, installation drawings and specifications.

V-Belts 56

Manheim Mfg. & Belting Co.—24-page Veelos V-belt catalog. It describes features of adjustable V-belts, construction details, illustrates how to couple and uncouple, measure and install. Also includes engineering data and 13 pages of application photos showing installation in a wide variety of industries.

Strainers 57

Elliott Co.—Bulletin A-12, describes the Type K self-cleaning strainers which are recommended for service where a large amount of dirt or foreign matter must be removed from water. The strainers contain a rotating element operated by a motor. Construction features and operating principles are described and the strainer is illustrated in detail.

Boiler Equipment 58

The Deming Co.—24-page bulletin No. CR 1 describes a complete line of condensation return units and boiler feed pumps. Gives information on various types of units and contains selection tables to simplify the selection of the proper units to meet the various steps of operating conditions.

Steam Generator 59

Orr & Sembower, Inc.—Bulletin No. 1215 telling the inside story of an automatic steam generating unit which produces steam in as little as 18 min. It outlines features of the "Power-master Steam Generator." A cutaway view clearly shows inside construction design. Standard equipment on the light oil and on the heavy oil units are described.

Carton Sealer 60

Container Equipment Corp.—4-page illustrated folder on CECO adjustable carton sealer. Contains description, specifications and dimensions.

Stainless Steel 61

Joseph T. Ryerson & Son, Inc.—36-page booklet, "Allegheny Metal in the Dairy Industry," covers special applications and performances records per-

taining to the dairy industry. Also includes information on corrosion resistance, physical properties, fabricating procedure and forms of Allegheny stainless steel available.

Air Cleaner 62

Logan Engineering Co.—12-page bulletin 147 describing the Aridifier, a centrifugal device for removing oil, water and dirt from compressed air. Sectional drawings show construction features. Capacity curves for the different sizes of equipment are included. A section is devoted to the selection of the Aridifier with relation to pipe size. Several pages show illustrations of actual installations.

Scales 63

"Better Ways to Weigh, Count, Test, Measure and Control" is the title of an 8-page release by Toledo Scale Co. Contains many application illustrations of Toledo scales.

Germicidal Lamps 64

"Product Protection with G-E Germicidal Lamps" is the title of a 12-page booklet by General Electric Co. Methods of application to reduce losses by preventing mold formation in many food processing operations, are briefly described and illustrated.

Centrifugal Pumps 65

Allis-Chalmers Mfg. Co. — Bulletin 52B6691 telling the operating advantages of "Pedrifugal" pedestal type centrifugal pumps made in five sizes for all general pumping requirements up to 500 gal. per minute.

Magnetic Clutches 66

A new 20-page catalog, No. 226, on magnetic clutches and clutch-brake units is announced by Stearns Magnetic Mfg. Co. It is a complete textbook on magnetic clutch application and contains specifications, illustrations, torque formulas, and other valuable information on magnetic friction device control.

High Side Floats 67

A new bulletin by Armstrong Machine Works describes Armstrong inverted bucket high side floats for discharging liquid refrigerant to low side of refrigerating systems. Includes diagrams of the operating principle and installation practice, prices and capacities.

Silent Chain 68

Link-Belt Co. — 16-page illustrated Book No. 2010 devoted to Link-Belt 3/16 in. pitch silent chain for fractional horsepower drives. Listed among its applications are blowers, bread slicers, conveyors, doughnut machines, ice cream freezers, meters and oil burners.

Open Heaters 69

Cochrane Corp.—22-page Publ. 4091 illustrates the various designs of tray and jet-type open heaters for use in boiler rooms and for heating water in laundries, and packing plants.

Magnetic Trap 70

Cesco, Inc.—4-page illustrated bulletin on Cesco sanitary magnetic trap for removal of tramp iron from liquids and slurries. Contains application and selection size suggestions and specifications.

Air Conditioning Units 71

A new illustrated catalog covering the two complete lines of Latenaire and Sensaire air-conditioning units designed by the American Coils Co., has just been issued. Included are remote and self-contained models of both floor and wall types, as well as duct-type

HOW TO GET THIS LITERATURE

Food Industries Reader Service now supplies tear-out coupon cards for your convenience in requesting copies of these new publications from manufacturers. Use one or more of the cards on the colored sheet bound near this page. Fill out, tear out, mail out and the Reader Service staff will see that your requests reach the manufacturers.

"Pulsating Magnet"

ELECTRIC VIBRATORS

Assuring free-flowing bins, hoppers and chutes. Prevent arching and plugging. Eight models—for all sizes and shapes of bins.

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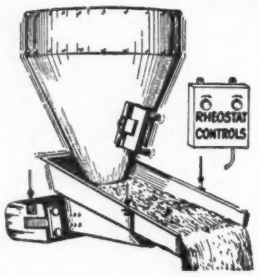
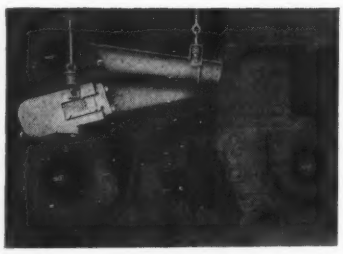


Easy, Economical Material Handling



"Vibra-Flow"

VIBRATORY FEEDERS

Controlling the feed of bulk materials—hot or cold, dry or damp, a fine powder or big lump—to processing equipment.

Write for literature

SYNTRON CO.

460 Lexington Homer City, Pa.

SPICEOLATES

THE BETTER SPICE FLAVORS

D.O

Spiceolates have many advantages — and can be used not only to extend your supplies of natural spice oils, but also as complete replacements for them. Spiceolates are very soluble in water and remain in good condition indefinitely under most any circumstances.

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Plant and Laboratories, Bayonne, New Jersey

WRITE US TODAY FOR YOUR COPY OF OUR NEW SPICEOLATE FOLDER

coil for use in conjunction with any forced air conditioning system. Complete specifications, engineering data, and a handy new air-conditioning calculator chart are included.

Oil Burners 72
National Airoil Burner Co., Inc.—16-page bulletin No. 65 illustrating and describing National low air pressure oil burners and Airovent centrifugal blowers. Contains 2 pages of specifications and dimensions, one page of piping and air flow data, and other useful data.

Coil Tanks 73
Lee Metal Products Co., Inc.—4-page bulletin LM-5 describes Lee corrosion resistant coil tanks with reversible propeller agitator for mixing brines, sirups and juices.

Materials Handling

Conveyor System 74
Food Machinery Corp.—8-page catalog describes the FMC unitized portable power conveyor system.

Plywood Pallet 75
"Save Time—Save Money with Superior Pallets and Trays" is the title of a 4-page folder by Plywood Specialties Corp., describing the plywood pallets and trays made by this company.

Handling Equipment 76
Lyon-Raymond Corp.—Bulletin 201 describes and illustrates general line of material handling equipment, including hydraulically-operated lift and pallet trucks, elevating tables and high lift trucks.

Pneumatic Conveyors 77
Holly Pneumatic Systems, Inc.—4-page illustrated folder, "A Harnessed Tornado for Unloading Your Materials," describes Holly pneumatic systems for handling loose bulk materials.

Conveyors 78
Trowbridge Conveyor Co.—8-page catalog No. 755 illustrating and describing portable flat belt conveyors for coal, coke and other non-abrasive materials; portable trough belt conveyors for sand, gravel, cinders and abrasive materials; general freight and special conveyors.

Trailers 79
Industrial trailers, dump trucks and special-purpose trailers are fully described in an illustrated 6-page booklet entitled "Trailers by Service" by Service Caster & Truck Corp.

Control Equipment

Flame Control 80
Combustion Control Corp.—Bulletin CG 475 describing Fireye Gas Flame Failure Safeguard for industrial gas ovens, kilns and boiler protection.

Control Valves 81
Hammel-Dahl Co.—34-page, 2-color catalog V-2 describing the 3000 Series "Flo-Tested" diaphragm control valves. Profusely illustrated with line drawings, cut-away views and photographs. Contains tables of dimensions and working pressure data, applications, design features and construction materials.

Canning Catalog 82
The application of control instruments to fruit and vegetable canning processes is illustrated in a 24-page bulletin No. 12-8, "Instruments for the Canning Industry," by Brown Instru-

What gives cartons of *Coated* Lithwite such a big eye-powered plus? The finer printing surface of this revolutionary board, of course.

***Coated* Lithwite's** clay coating is *filmed* on by an advanced precision process in which Gardner-Richardson has had 8 straight years of pioneering experience. And it's filmed on a *base stock* that reflects Gardner-Richardson's 89 years of papermaking know-how.

Result: a clay coated board that is appealingly white, bright, exactingly level . . . that brings colors up brilliantly, reproduces pictures with true-to-life realism. *Coated* Lithwite is rub-resisting, fade-resisting, too . . . takes a positive seal . . . folds and scores without flaking.

* * *

Additional Equipment for the production of *Coated* Lithwite is being installed and may be ready in time to make your next run of cartons. We'd like to show you how cartons of this *plus* clay-coated board can give your product a *big plus* in the hard-selling days ahead.

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Manufacturers of Folding Cartons and Boxboard, Middletown, Ohio

*Reg.U.S.Pat.Off.

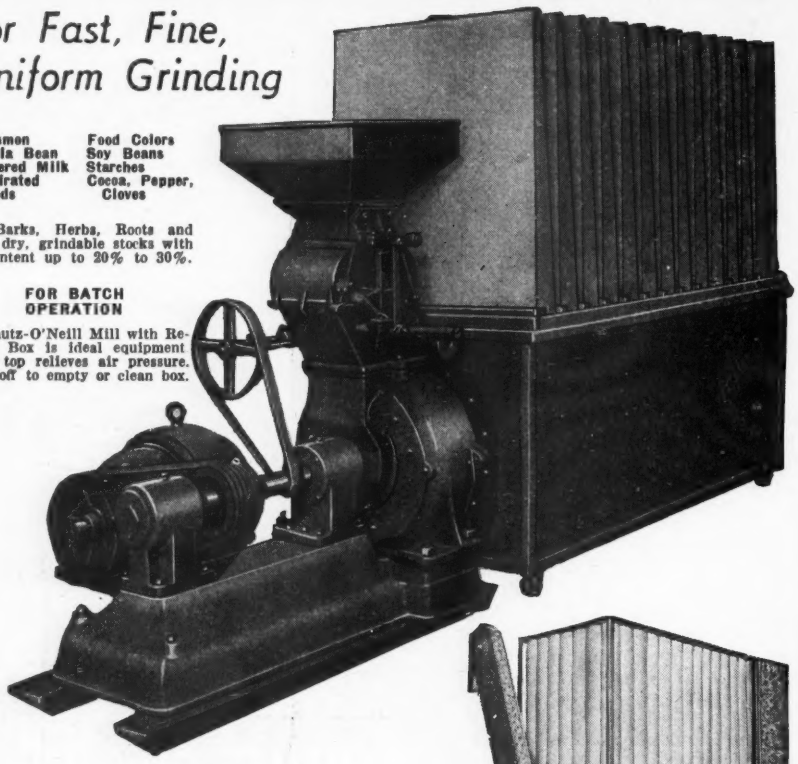
Sales Representatives in Boston, Chicago, Detroit, New York, Philadelphia, Pittsburgh, St. Louis.

Specify SCHUTZ-O'NEILL PULVERIZERS

For Fast, Fine, Uniform Grinding

Cinnamon
Vanilla Bean
Powdered Milk
Dehydrated Foods
Food Colors
Soy Beans
Starches
Cocoa, Pepper, Cloves

All Barks, Herbs, Roots and other dry, grindable stocks with oil content up to 20% to 30%.



FOR BATCH OPERATION

A Schutz-O'Neill Mill with Receiver Box is ideal equipment. Cloth top relieves air pressure. Lifts off to empty or clean box.

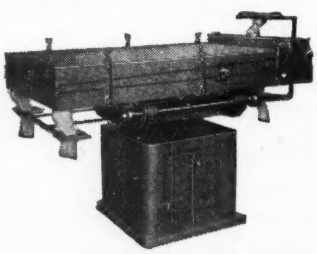
Schutz-O'Neill Pulverizers utilize the principle of centrifugal air force impact, which is fast and produces a uniform product for superfine grinding up to 400 mesh. For products with high moisture or oil content, Schutz-O'Neill has special equipment. Schutz-O'Neill Pulverizers are made in 12", 16", 20", 22", 24" and 28" sizes with capacities ranging up to 2,000 lbs. per hour.

FOR CONTINUOUS OPERATION

the expansion Tubular Collector with screw conveyor feed to elevator discharge will handle from 300 to 700 lbs. per hour of most products.

Consult Schutz-O'Neill ON PULVERIZING PROBLEMS

Schutz-O'Neill has a great variety of Mill Plans for different purposes. If you will write us your requirements, products to be pulverized, output desired, and send a sample Schutz-O'Neill engineers will recommend the correct size and type of mill and the most efficient Mill plan for your use. This in no way obligates you. Literature on request.



GYRATOR SIFTER

The Schutz-O'Neill Gyrator Sifter produces a ground product free from threads, fibre, waste, coarse particles, etc. Made with 1 to 4 sieve frames for single or multiple separations.

Some territories are open for Sales Engineers on Schutz-O'Neill products. Write stating qualifications.

ESTABLISHED 1893

SCHUTZ-O'NEILL CO. DIVISION OF PARTEN MACHINERY CO.

PULVERIZERS · BREAKER MILLS · ROLLER MILLS · BURR MILLS · HAMMER MILLS

309 SIXTH AVENUE SOUTH • MINNEAPOLIS 15, MINNESOTA

ment Co. In addition to application illustrations, a large number of control equipment items are pictured together with descriptions, specifications and suggested applications.

Diaphragm Motors 83
Conoflow Corp.—8-page bulletin No. 101, "Characteristics of Pneumatic Diaphragm Motors." Contains photographs of Conometers on various valves, application diagrams, graphs and tables.

Plant Supplies

Paper Containers 84
Zinpak Corp.—Illustrated bulletin on Zinpak Never-Leak Containers. Describes the Zin-package maker and a few of the shapes and sizes of paper containers available.

Packaging 85
Chase Bag Co.—16-page brochure featuring various types of bags and packaging materials. Contains a brief history of this company which was founded in 1847.

Adhesives 86
Casein Co. of America, Div. of the Borden Co.—Gluing chart describes the required properties of glues for various jobs, and lists the glues recommended for each job.

Frozen Fruit Manual 87
Hoffman-La Roche, Inc. — 33-page brochure outlining methods for producing new frozen fruit products, close to fresh packed fruit in color and flavor, by the use of ascorbic acid.

Flavors 88
Basic Food Materials, Inc.—"Red Magic," a 10-page illustrated brochure containing condensed information about B.F.M. sweet red peppers in brine.

Horticultural Chemicals 89
Thompson Horticultural Chemicals Corp.—22-page illustrated brochure on Thompson hormone and hormone-like horticultural products. Describes specifically: Weedicide; Fruit fix; Tomato fix; Ree-root; Transplant; Pree-plant; and vitamin B_1 plus pellets.

Miscellaneous

Packaging System 90
St. Regis Paper Co.—Case history No. 15, "How a St. Regis Packaging System Made a Triple Saving."

Conduit 91
Ric-Wil Co.—4-page leaflet featuring the tile and cast iron conduit systems for use in underground insulated pipe systems.

Lighting 92
"Balanced Lighting, What It Is, Why You Need It," an 11-page illustrated booklet by Fostoria Pressed Steel Corp. Contains sections on: What Is Balanced Lighting; Why Balanced Lighting and Benefits of Balanced Lighting.

Strapping Tools 93
A. J. Gerrard & Co.—Two 4-page folders: one on "Bulkbinder," heavy duty strapping tools and equipment; the other on "Steelbinder," the only tool which uses ⅜, ½, ⅝ or ¾ in. straps of any thickness up to 0.028 in. without mechanical adjustment. Both folders contain application illustrations and ordering specifications.

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

DEHYDRATION

Drying Carrot Pieces

DRYING-RATE characteristics of ¼ x ⅜ x ⅜-in. pieces of Chantenay carrots are presented nomographically in circular AIC-31-VIII recently issued by Western Regional Research Lab., U.S.D.A., Albany, Calif. Nomographs deal with drying rates on both metal grid and wooden slat trays under cross air flow conditions. Carrots were peeled by abrasion, trimmed by hand, washed and cut into pieces in a mechanical cutter. Pieces were steam blanched at atmospheric pressure for 4 min., air cooled for 5 min. and loaded on drying trays.

Digest from "Drying-Rate Nomographs. VIII. Carrot Pieces," Circular AIC-31-VIII, Western Regional Research Laboratory, U.S.D.A., May, 1947.

Dehydrating Method

DEHYDRATING foodstuffs in an atmosphere containing volatile substances corresponding to selected volatile flavoring constituents inherent in the foodstuff is the object of a recently patented method. This is accomplished in specially designed equipment by the use of a desiccant substantially saturated with the volatile flavoring constituent while maintaining the desiccant low in water content, and circulating the same atmosphere through foodstuff and desiccant.

Digest from U. S. Patent 2,421,121, issued May 27, 1947, on an application dated May 5, 1945, to A. J. Haagen-Smit, and assigned to California Institute Research Foundation, Pasadena, Calif.

QUALITY CONTROL

Gel Strength Measurement

A PROCEDURE which gives the tensile strengths of gels by balancing the cohesive forces of the gel against a gradually increasing weight until the yield point is reached has been developed at the National Bureau of Standards.

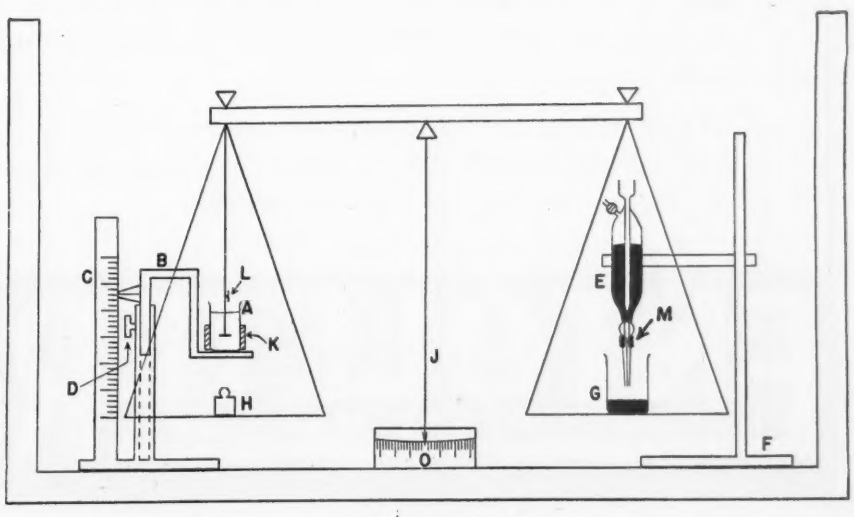
A brass disc is suspended in a beaker containing the gel by means of a wire attached to one beam of an analytical balance. Mercury is added, from a burette with a removable calibrated capillary tip, at a constant rate to a container on the other pan. As the mercury is added, the height of the platform is changed manually, so that the pointer of the balance is always kept at zero. A vertical scale, indicating the height of the adjustable platform, is read at frequent intervals until the gel is broken. The weight of mercury required to produce a fracture in the gel, divided by the area of the disc, gives gel strength in g. per sq. cm. The rate of change in height of the adjustable platform gives an indication of the resistance the gel offers to deformation.

Digest from "Mercury-Balance Method for the Measurement of Gel Strength," ES-1092, National Bureau of Standards, Washington 25, D. C.

Infrared Moisture Tester

MOISTURE determinations to an accuracy of 0.1 percent on a 5-g. sample, by a new method in which infrared lamps supply the heat for drying, give moisture percentage in 5 to 12 min. for many granular materials on a direct reading balance type instrument.

The instrument consists of an unequal arm balance with a pointer on one end of the beam to indicate moisture percentage on a scale. The pan for the sample rests on a stem extending through the top of the balance case into the infrared lamp chamber above. The damping cylinder and piston are below the pan stem and balance beam. When a sample is put on the pan and the infrared beam played on it, moisture is driven off and the pointer indicates a constant moisture loss after 4 to 8 min. for most materials. A rider is used to take care of moisture greater than 5 percent and the updraft due to weighing a warm sample is corrected for by determining its amount with a 5-g. weight on the pan. In practice,



APPARATUS for the accurate determination of tensile strength of gels.

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Stop Losses from Insects

...Use the "ENTOLETER" Continuous Control System for Plant and Product Cleanliness

Operating records prove that "ENTOLETER" Continuous Control destroys all forms of insect life. In addition to this service, mills and food plants are reaping other benefits from the "ENTOLETER" system. Here are three positive advantages.

1 KILLS ALL INSECT LIFE

Now, more than ever, your plant and products need the "ENTOLETER" system of continuous insect control. It helps you to avoid waste of scarce food materials . . . to protect product ingredients . . . to insure the high standards of your products.

2 ESSENTIAL IN FRAGMENT CONTROL

The "ENTOLETER" system is being used successfully to reduce fragment count. Send for a copy of our latest bulletin describing methods of application.

3 AIDS PRODUCT UNIFORMITY

Food plants and flour mills have found that the "ENTOLETER" system offers an excellent means of blending flours, mixing ingredients in compounds and improving vitamin distribution. This, alone, more than justifies its cost.

For New Bulletin on "ENTOLETER" Continuous Insect Control System, write to ENTOLETER DIVISION, The Safety Car Heating and Lighting Co., Inc., P. O. Box 904, New Haven 4, Connecticut.

ENTOLETER
CENTRIFUGAL MACHINES
REG. U. S. PAT. OFF.

CONTINUOUS INSECT CONTROL SYSTEM

moisture determinations were made on bran, malt and palm oil in 8 min., flour in 10 min., legume meal in 11 min.

Digest from "The Infra-Red Direct Reading Moisture Tester," by R. B. Brock, *Chemistry and Industry*, 299-302, May 31, 1947.

PACKAGING

Sausage Casing

PACKAGING a perishable food product such as sausage in a tubular casing made of material that when heated at or below 212 deg. F. will contract to conform closely to the content without wrinkling, is the object of a recently patented invention.

The method comprises forming a tubular casing from rubber hydrochloride, with or without plasticizers, heating and stretching it circumferentially to not more than 150 percent of its original size and cooling to set it in the stretched condition. The food product is then enclosed in the stretched casing and the casing and contents heated to a temperature not less than the original stretching temperature to contact the casing tightly against its contents.

Digest from U. S. Patent 2,420,310, issued May 13, 1947, on an application dated April 9, 1941, to Leo A. Goodman, Brooklyn, N. Y., one-half assigned to Marcleph & Co., Inc., Brooklyn, N. Y.

FERMENTATION

Citric Acid From Beet Molasses

LABORATORY investigation of the use of beet molasses in citric acid fermentation by molds has attained yields of citric acid of approximately 50 percent of the available sugar calculated as sucrose. The mold used was a strain of *Aspergillus niger* which was found in preliminary experiments to produce a maximum amount of citric acid in the shortest time and to be adapted to fermentation of a beet molasses substrate.

Because beet molasses contains a comparatively high percentage of metals (particularly iron) which may inhibit the formation of citric acid, a medium was prepared by treating 340 g. of beet molasses with 0.6 g. of potassium ferrocyanide, making the whole up to one liter with distilled water, adding 10 g. of diatomaceous earth, and allowing to stand over night. Subse-

(*Continued on page* 180)

"better nutrition" time!

When school time rolls around, a mother just naturally starts thinking about improving her children's diet. Not that a mother doesn't consider better nutrition important every day of the year.

She wants her children to do well in their studies, make good grades—develop strong minds and strong bodies.

One of her chief roles in their education and growth is to see that they are properly nourished with the right kind of food.

School time or any time, more and more housewives are looking for the word "fortified" on the food packages they buy. It's their assurance of a better diet for their families.

Many progressive manufacturers have noted this trend, and are doing something about it. Many are fortifying their foods to help the housewife in her daily search for better nutrition.

If you are considering fortifying one or more of your food products, remember this: Standard Brands' experience in the food fortification fields—and its products for vitamin B-complex, vitamin D and protein supplementation of foods—place this company in a position to render valuable assistance to you.

We will be glad to assist any manufacturer who may need help in fortifying food products. We invite you to discuss your needs in confidence with one of our technical representatives. Write to the address below.

Products containing
VITAMIN D

Fleischmann's Hy-Dee
Irradiated Dry Yeast

Fleischmann's Irradiated Dry Yeast
Type 700-H

Standard Brands Viosterol
(Activated Ergosterol) Steenbock Process

Products containing
NATURAL B-COMPLEX FACTORS

Fleischmann's
Pure Dry Primary Yeasts *(Brewer's Strain)*

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quently the medium was autoclaved at 250 deg. F. for 15 minutes. Optimum pH level for this treatment was approximately 7.0; and best fermentation temperature was 86 deg. F. A comparatively heavy seeding of spores was necessary for satisfactory germination, and heavier inocula shortened the time of incubation.

Digest from "Citric Acid Fermentation of Beet Molasses," by P. Gerhardt, W. W. Dorrell and I. L. Baldwin, *Journal of Bacteriology*, vol. 52, 555-564, November, 1946.

DAIRY

Dried Milk Powder

COMPOSITION of solids-not-fat as an important factor in milk powder deterioration is suggested by the results of storage tests carried out with skim milk powders made from fall and spring milks.

Initial palatability of skim milk powders made from fall milk was higher than that from spring milk, but the palatability decreased during 16-wk. storage at 80, 100 and 120 deg. F. Similar powders from spring milk stored at 80 deg. increased in quality throughout the storage period, while those stored at 100 and 120 deg. first increased and then decreased in quality.

Powders of 26-28 percent butterfat, produced in spring or fall, had equal palatability scores and deteriorated equally in storage. Fall milk powder containing 30 percent fat was better initially than the comparable spring sample, but when stored, quality changes in both types were about equal.

Digest from "Dried Milk Powders. VII. The Effect of Season of Production on Keeping Quality," by J. A. Pearce and W. A. Bryce, *Canadian Journal of Research*, vol. 25, 13-17, January, 1947.

FATS and OILS

Pigment in Cottonseed Oils

PIGMENTATION of crude cottonseed oil depends principally upon the pigmentation of the original seed and upon the moisture content of the seed during cooking. Several samples of crude hydraulic- and screw-pressed oils, produced under known processing conditions, were found to differ greatly with respect to original color and refining characteristics. Screw-pressed oils were more deeply colored and contained one principal pigment. Hydraulic-pressed oils contained two principal pigments. Pigments differed from gossypol, but were removed during alkali refining.

How much is a valve worth?

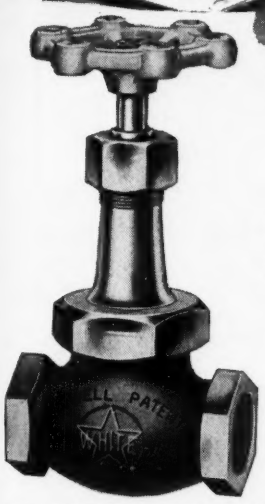

Fig. 1708—200-pound Bronze Globe Valve with screwed ends, union bonnet, renewable, specially heat treated stainless steel seat and regrindable, renewable, wear-resisting "Powellium" nickel-bronze disc.

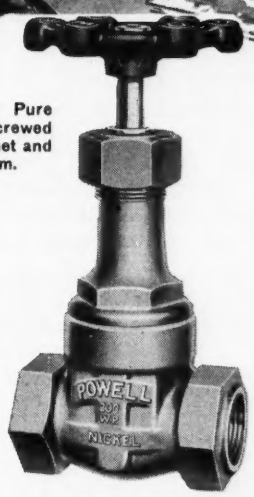

Fig. 1830—200-pound Pure Nickel Gate Valve. Screwed ends, screwed-in bonnet and inside screw rising stem.

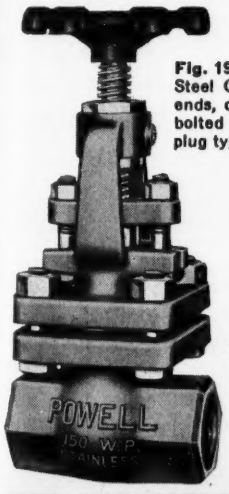

Fig. 1978—150-pound Stainless Steel Globe Valve with screwed ends, outside screw rising stem, bolted flanged yoke-bonnet and plug type disc.

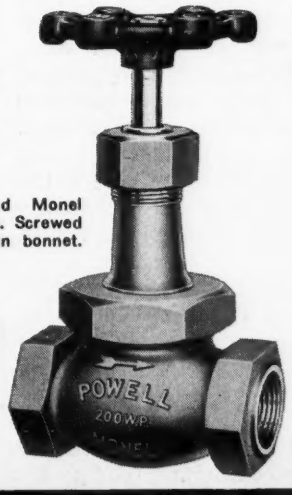

Fig. 1834—200-pound Monel Metal Globe Valve. Screwed ends and screwed-in bonnet.

*A registered trade name of the International Nickel Company, Inc.

The $64 question is not "what is the price of the valve," but "how much is it worth?"

And the measure of its worth is "will it do the job, how long will it give satisfactory service, and what will be the ultimate cost of maintenance?" For in addition to the cost of labor and materials in maintaining a valve, don't lose sight of the serious loss in production while a valve is "down" for repairs or replacement.

The Powell Line is so complete* that there's always a Powell Valve specifically adapted to do the job. Powell Valves are noted for long-life, satisfactory service. Powell Valves are designed to reduce maintenance and shut downs to a minimum.

*The Powell Line includes Bronze and Iron Valves of every required type, design, size and pressure; Cast Steel Valves of every type, in pressure classes from 150 to 2500 pounds; and, for the chemical and process industries, a complete line of Corrosion-Resistant Valves in the widest range of pure metals and alloys ever used in making valves.

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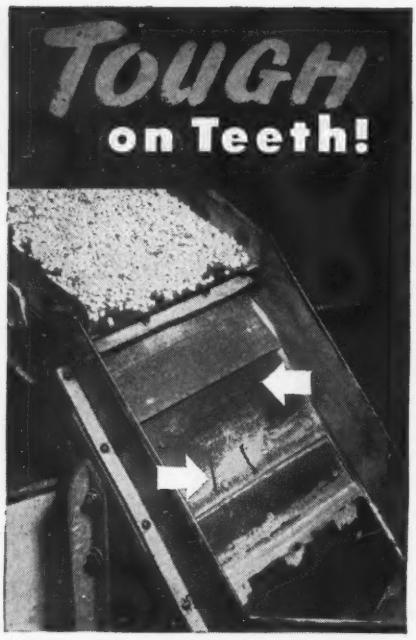
POWELL VALVES



...If This DINGS MAGNET Didn't Catch the Iron

The picture shows a Dings electric spout magnet in the peanut butter department of a large food processor. It takes stray iron—nails, wire, screws—out of the flow of nuts to the crushing mills. Does double duty: keeps iron from damaging the mills and keeps it out of somebody's sandwiches! It is the kind of simple, positive protection every food plant needs.

Dings builds a complete line of "High Intensity" electromagnetic separators for removing iron from wet and dry substances whether it is handled on belts, in chutes or through pipes. For literature about equipment to meet your needs, write describing your requirement.

World's Largest Exclusive Builder of Magnetic Separators
Established 1899

Dings Magnetic Separator Co.
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Dings MAGNETIC SEPARATION HIGH INTENSITY

On the basis of their absorption spectra it was deduced that the alkali-refined hydraulic pressed oils contain two or three pigments originally present in the crude oils. Alkali-refined screw-pressed oils contain these same pigments plus a large number of decomposition products of the principal crude oil pigments.

Digest from "Processing of Cottonseed. I. Pigment Distribution in Oils and Meals Produced by Hydraulic and Screw Press Methods," by C. H. Boatner, C. M. Hall, R. T. O'Connor, L. E. Castillon and M. C. Curet, *The Journal of the American Oil Chemists' Society*, vol. 24, 97-106, April, 1947.

Flavones as Antioxidants

FLAVONES, as illustrated by quercetin, quercitrin and rutin, are effective antioxidants for milk fat and lard. When incorporated at the rate of 15 mg. in 100 g. fat, quercetin extended the times required to reach a peroxide value of 5 for milk fat or 10 for lard, from 30 to over 144 hr. for milk fat and from 26 to over 96 hr. for lard. Competent judges were unable to detect by taste or color the presence of at least 30 mg. of quercetin per 100 g. in butter oil, lard or butter-like preparations made from them. The article contains charts and tables showing the effect of other flavone-type compounds as antioxidants.

Digest from "Flavones and Flavone Derivatives as Antioxidants," by G. A. Richardson, M. S. El-Rafey and M. L. Long, *Journal of Dairy Science*, vol. 30, 397-413, June, 1947.

FRUIT PRODUCTS

Pectin Quality

QUALITY of the pectin extractable from dehydrated fruits and vegetables correlates well with general appearance, flavor and eating quality of the rehydrated cooked food. Where it is applicable the pectin test is suitable as a guide for the processor, the wholesale purchaser, or in studies of deterioration with age.

Pectin may be extracted by soaking 100 g. of fruit in 900 ml. of water containing 2.5 g. of sodium hexametaphosphate, at 79 deg. F., for 1 hr. The soaked fruit is comminuted in a Waring blender for 5 min., boiled for 10 min., strained and the extract clarified. The pectin is precipitated with two volumes of 90 percent isopropyl alcohol, dried, and its viscosity (Ostwald) determined in a 0.5 percent solution. From the viscosity, the grade of the pectin may be calculated.

For apples and peaches there is

CASE HISTORY No. 18

One in a series of factual experiences of a group of American manufacturers with Multiwall Paper Bags.

TOTAL AMOUNT SAVED (PER LB.)

3/4¢ Saved by Producer through use of Multiwalls

1/2¢ Passed on to Customers through use of Multiwalls

CLASS OF PRODUCT PACKED

CEMENT	FERTILIZER
CHEMICALS ✓	FOOD
FEEDSTUFFS	MISCELLANEOUS

PRODUCT CHARACTERISTICS

ABRASIVE	GRANULAR ✓
CORROSIVE	HEAVY
DELIQUESCENT	HYGROSCOPIC
FLUFFY	LIGHT
FREE-FLOWING ✓	VISCOUS

St. Regis Packaging Systems are designed to meet a wide range of product requirements and plant layouts. Packers are available in a variety of sizes and types, with filling speeds as high as twenty-four 100-lb. bags per minute—with one operator. Nearly 400 commodities—rock products, fertilizers, chemicals, foods, and feeds—are now being packaged in sturdy, low-cost multiwall paper bags.

Multiwall Paper Bags Save Money for Producer and Customers

One of America's large chemical companies has installed St. Regis valve bag filling machines to pack one of its products in 50-lb. multiwall paper bags. Formerly, this company had used fibre drums.

The changeover to Multiwalls provided these

BENEFITS TO THE PRODUCER

- Saving in container cost.

  A saving in packing and handling costs of approximately ¾¢ per lb. Here is the way this was achieved:

- Only one freight car of empty Multiwalls was required to package the same amount of material as *ten* cars of empty drums.
- Empty Multiwalls required 65% less storage space than drums.
- Multiwalls required 15%-20% less storage space than filled drums.
- 30 filled Multiwalls can be loaded on a pallet, resulting in fast and efficient movement to storage and shipping rooms.
- Lower tare weight of Multiwalls.

BENEFITS TO CUSTOMERS

- Saving in material costs through reduced prices of product packed in Multiwalls.
- Multiwalls open easily and quickly.
- Multiwalls' convenient size reduces handling effort. Workers prefer Multiwalls.
- Shop handling and labor costs reduced.
- Compact Multiwalls increase storage space 15%-20%.
- Multiwalls are readily resold to used bag dealers. An extra profit item.

For the complete story of this *MONEY SAVING PACKAGING OPERATION* simply mail the coupon. Learn how the basic principles of St. Regis' economical packaging system can be applied to *your business*.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

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How to Eliminate Packaging Shrink . . .

Checkweighing ripe olives in #10 cans at Bell Packing Co., Berkeley, California.

Fruits and vegetables generally are more efficiently processed now than ever before and at lower costs. This is due in the main to better machinery . . . less man-power. Today packaging shrink does not loom large due to sound checkweighing to fraction-ounce accuracy and this has helped profits. EXACT WEIGHT Scales are a definite controlling factor in eliminating packaging shrink. Packages are more uniform . . . weights more accurate . . . profits protected. These scales speed operation . . . make packaging easier . . . deliver greater volume in less time. Whatever you package, wet or dry, there is an EXACT WEIGHT Scale for the operation. Write for details!

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THE EXACT WEIGHT SCALE COMPANY
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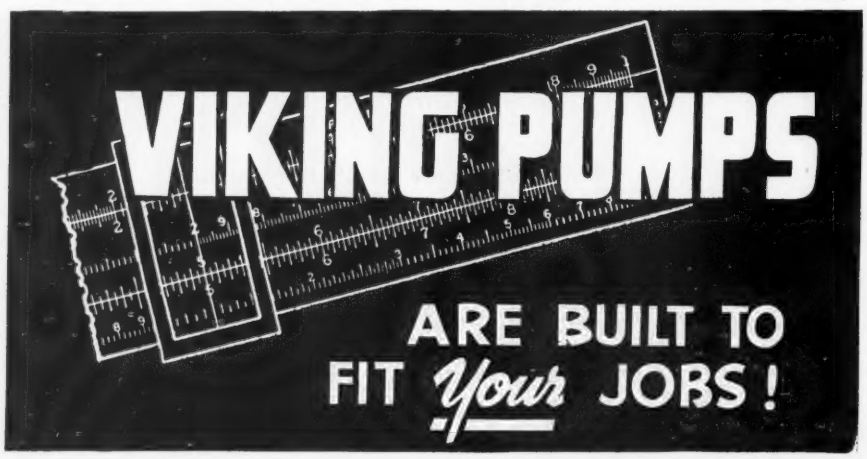

The reason why Viking Pumps so successfully handle all types of clean liquids, regardless of viscosity, is that they are built from start to finish for your job in the size and style YOU need.

Ruggedly built with no small intricate parts. They are self-priming with low speed, even and steady discharge which assures good, dependable service.

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VIKING PUMP COMPANY
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a straight line relationship between the grade of the pectin obtained by this method and the quality of the fruit, using a scale of from 0 for a completely worthless product to 100 for a freshly dehydrated fruit of very high quality. A score of 60 is the limit of acceptability. Apricots do not show a smooth curve; a better curve is obtained by multiplying grade of the pectin by its methoxy content.

Digest from "Pectinic Acids as Related to Texture and Quality of Dehydrated Fruit Products," by G. L. Baker and W. G. Murray, *Food Research*, vol. 12, 129-132, March-April, 1947.

Nonrigid Jellies

JELLIES to meet bakers' needs for a material that will spread like jam are made by a recently patented process. To a pectin-containing jelly batch a suitable buffer or alkali is added in sufficient quantity to bring the pH between 4 and 7, during a boiling period of 5 to 30 min., after which the pH is reduced to below 4 with acid and the product used in the normal manner.

Digest from U. S. Patent 2,421,093, issued May 27, 1947, on an application dated Feb. 18, 1942, to Donald R. Thompson, and assigned to California Fruit Growers Exchange, Los Angeles, Calif.

BAKING

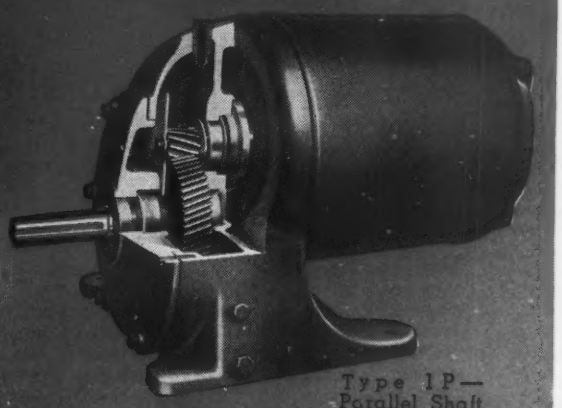
Graham-Type Soy Crackers

GRAHAM-TYPE crackers, fortified with soy grits, have nutritional qualities markedly superior to those of regular graham crackers. Nutritional effect of fortifving graham crackers by the substitution of 30 percent soy grits for the graham flour, and by the addition of calcium, riboflavin, niacin, carotene and vitamin D was studied. Two biological technics were used: A 26-wk. growth test in which crackers were fed to rats as the sole source of food, and an 8-wk. protein assay.

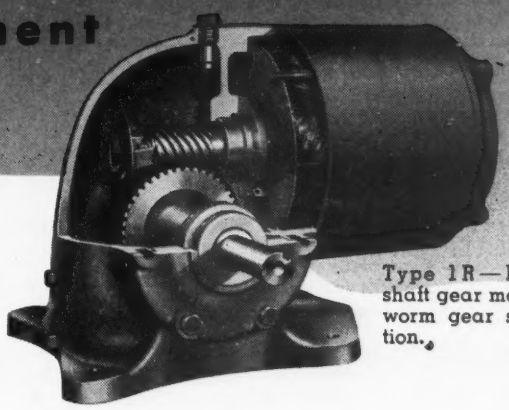
Fortified crackers promoted growth at the rate of 2.8 g. per day the first 8 wk. All rats were alive and healthy at the end of 26 wk. All animals fed regular graham crackers lost weight the first 8 wk. and died at the end of 9 to 20 wk. The studies indicate that regular graham crackers are deficient primarily in protein, rather than in vitamins or minerals.

Digest from "A Nutritional Study of the Fortification of Graham-Type Crackers with Soy Grits, Calcium and Several Vitamins," by S. C. Carlson, E. C. Herrmann, R. M. Bohn and J. W. Hayward, *Cereal Chemistry*, vol. 24, 215-224, May, 1947.

CENTURY
Fractional Horsepower
GEAR MOTORS
Are Engineered to Maintain the High Torque Slow Speed Shaft in Rigid Alignment



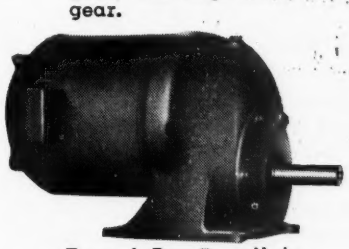
Type 1P—Parallel Shaft Gear Motor, one step speed reduction.



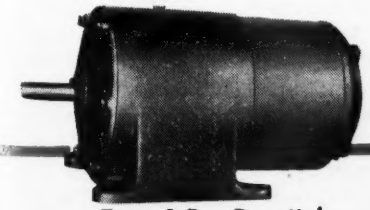
Type 1R—Right angle shaft gear motor, one step worm gear speed reduction.

Type 1 R—Right angle shaft gear motor, one step worm gear speed reduction

Type 2 R—Right angle shaft gear motor, two step speed reduction—one step helical gear, one step worm gear.



Type 1 P—Parallel shaft gear motor, one step helical gear reduction



Type 2 P—Parallel shaft gear motor, two step helical gear reduction

The mounting feet of Century Gear Motors are an integral part of the rugged compact gear housing—provides a strong, rigid unit. Additional mechanical strength is achieved by locating the shaft close to the base of the gear housing. This method of construction holds the high torque slow speed shaft in rigid alignment, and reduces stresses.

The motor is equipped with ball bearings Large taper roller bearings in the gear unit handle heavy radial or thrust loads.

Century Gear Motors are built in standard sizes from 1/8 to 3/4 horsepower — single phase, polyphase and direct current.

Century's line of fractional horsepower gear motors has gained an enviable reputation for outstanding performance. Many thousands of them have been put into service since their introduction eight years ago.

Specify Century Gear Motors for all your fractional horsepower slow speed requirements

Century C MOTORS

CENTURY ELECTRIC CO.
1806 Pine St., St. Louis 3, Mo.
Offices and Stock Points in Principal Cities

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Until you have seen this Spraying Systems Catalog, it is likely you have never had all the facts on the thousands of spray nozzles available to you. Consistently changeover to Spraying Systems Spray Nozzles has resulted in greater spraying efficiency and lower costs. In part this is due to advanced hydraulic design . . . but in big part it is due to no other reason than that Spraying Systems Spray Nozzles number in the thousands of types and sizes . . . a group so great, that for any given application, there is a spray nozzle to fit your application exactly. Prove this to yourself . . . write for Catalog No. 22

SPRAYING SYSTEMS CO.

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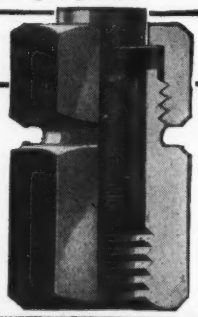
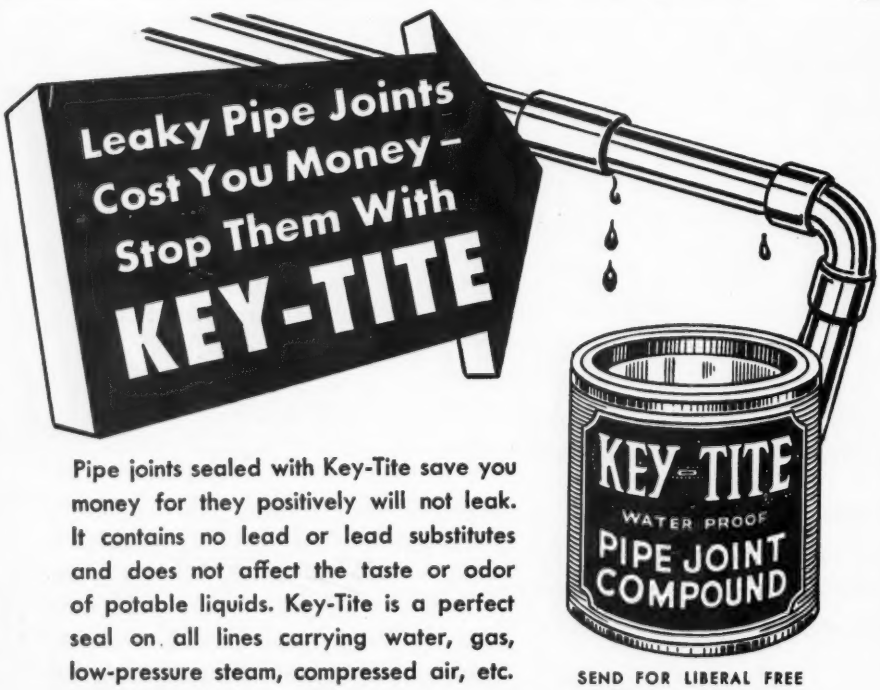
INSECTICIDE SPRAYING
Residual Type

Approved spray nozzle type 1/4 T-8001, 1/4 T-8002 and others provide important uniform density of spray pattern for the residual spraying of insecticides such as DDT. Complete information on spray nozzles for all applications sent on request.



SPECIALISTS IN SPRAY NOZZLE DESIGN AND MANUFACTURE



Pipe joints sealed with Key-Tite save you money for they positively will not leak. It contains no lead or lead substitutes and does not affect the taste or odor of potable liquids. Key-Tite is a perfect seal on all lines carrying water, gas, low-pressure steam, compressed air, etc. Joints are easily opened, too, for it will not freeze in the joint.

SEND FOR LIBERAL FREE SAMPLE. Try it in your plant at no cost, see for yourself. You will be amazed at the results.

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39

MICROBIOLOGY

Phenylacetic Acid in Penicillin Production

EARLY in the recent production of penicillin American workers isolated penicillin G, characterized by the benzyl radical and yielding phenylacetic acid as a degradative product, whereas English workers produced penicillin F containing a pentenyl radical and yielding no phenylacetic acid. This suggested that the latter could be used as a building block in the production of penicillin G. Experiments conducted to that end showed that total penicillin yield was increased in both surface and submerged cultures by the controlled addition of phenylacetic acid to the culture media. The effectiveness of this addition was closely related to the toxicity of the chemical, the degree of which depended both on the concentration of the acid and the pH of the culture. The addition of whole-wheat bran and phenylacetic acid to submerged cultures resulted in a marked increase in the speed of penicillin accumulation. The optimum concentration of phenylacetic acid was not clearly determined, but appears to be between 0.2 and 0.8 g. per liter of culture medium. The most favorable pH was about 5.5, which could be adjusted initially or obtained as fermentation proceeded.

Digest from "Penicillin: X—The Effect of Phenylacetic Acid on Penicillin Production," by A. J. Moyer and R. D. Coghill, *Journal of Bacteriology*, vol. 53, no. 3, 329-341, March, 1947.

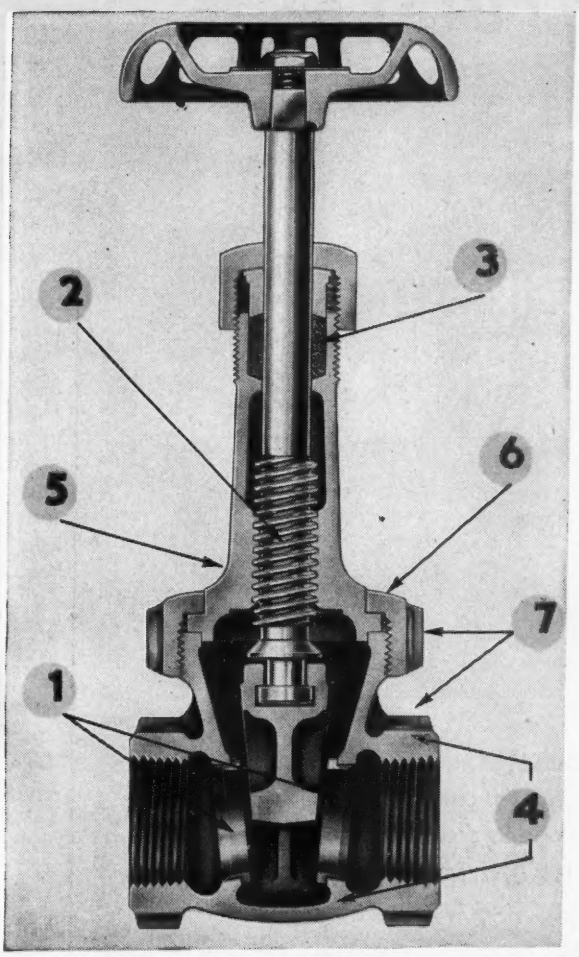
MISCELLANEOUS

Processing Winery Slop

RECOVERY of crude cream of tartar and production of a cattle and poultry food are the objects of a patented method of treating winery slops. From a steam heated mixer the slops are fed continuously to an imperforate overflow centrifuge. The cake, consisting of suspended organic matter, is combined with pomace from the winery, and the clarified overflow is sent to a multiple effect evaporator. Concentration is carried to a point at which the potassium acid tartrate may form crystals in the viscous solution. The latter is then transferred to a crystallizing tank in which it is cooled to a temperature at which the bulk of the potassium acid tartrate crystallizes. This mixture is then fed to a centrifuge, the cake

IT'S NEW . . . IT'S FAR AHEAD — IN DESIGN—IN DURABILITY

JENKINS FIG. 270-U BRONZE GATE VALVE



1. "MONEL" SEAT RINGS EXPANDED IN BODY The seat rings, expanded into place in the body, are equivalent to integral faces. The "MONEL" metal used is about 2½ times the hardness of valve body bronze—provides exceptional resistance to erosion and corrosion.

2. LARGE SPINDLE THREADS LAST LONGER The threads on the traveling spindle are exceptionally long and large in diameter. This reduces wear to a minimum and insures easy operation. Spindle metal is hard, tough manganese bronze.

3. DEEP STUFFING BOX—MORE PACKING Deeper than most 200 lb. gate valves, it holds more packing. Keeps stuffing box tight around spindle with less friction, and permits spindle to be turned with less effort.

4. LIBERAL BODY DIMENSIONS ADD STRENGTH Made of 35,000 lb. tensile strength cast bronze—has full length of pipe threads and liberal clearance between threaded ends and diaphragm wall. Union assembly reinforces and strengthens body neck.

5. EXCEPTIONALLY RUGGED BONNET Projection on bottom assures snug fit into neck of body. Large diameter Acme threads, with long bearing, assure improved wear resistance. Machined bevel on underside matches beveled shoulder on spindle for back-seating under pressure and protecting spindle threads when valve is wide open.

6. HEAVY BONNET RING Union Bonnet joint withstands exceptionally high hydraulic pressures. Liberal thread engagement assures assembly that can be made tight and kept tight after repeated disassembly.

7. BODY AND BONNET RING LUGS Rugged sturdy lugs of novel design on body ends and bonnet ring permit repeated application of conventional wrenches.

AGAIN JENKINS PRACTICAL ENGINEERING SETS THE STANDARD FOR VALVE ECONOMY

● *IF ANY PART of the seating combination is to eventually need replacement, why not have it the most accessible part—the wedge rather than the seat? It's easier, quicker, cheaper to slip on a new wedge, than to install a new body!*

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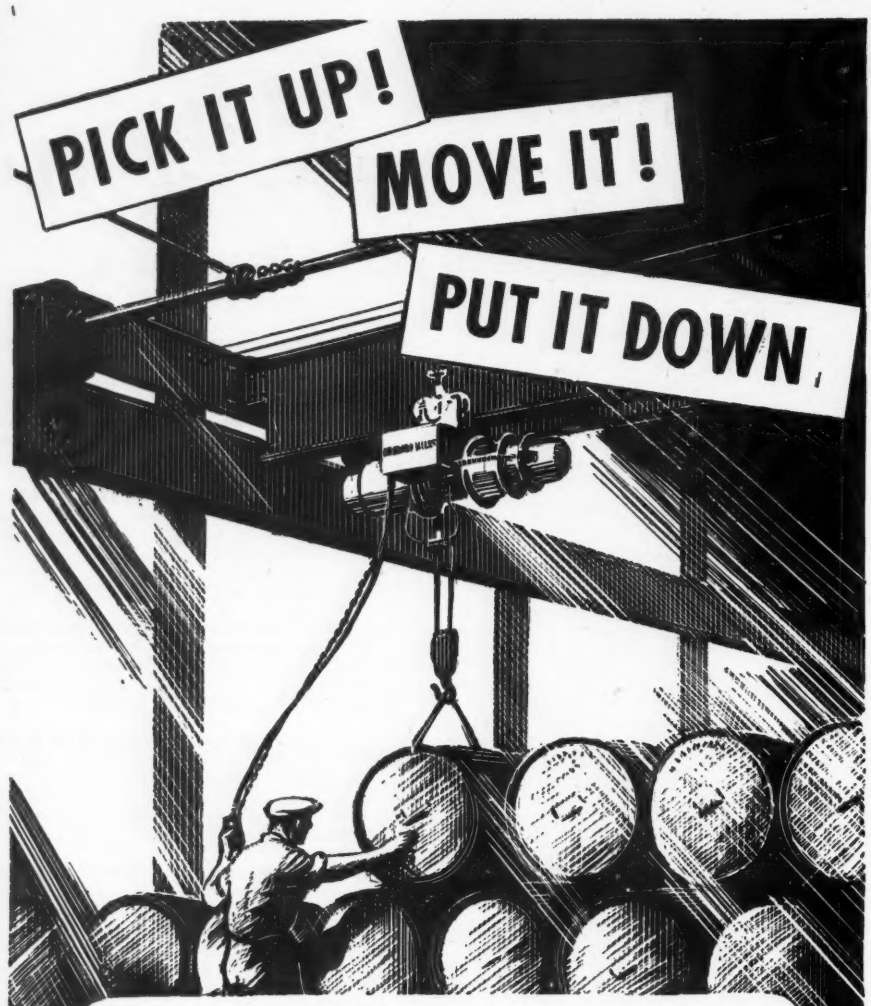

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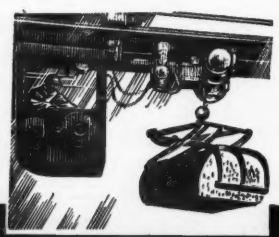

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of which is passed to a steam heated drier which yields a crude, substantially dry potassium acid tartrate. The solution leaving the centrifuge is fed to, and thoroughly mixed with, the pomace from the winery. The mixture is steam dried, disintegrated, and sacked or transferred to cars for bulk shipment as a cattle and poultry food.

Digest from U. S. Patent 2,404,398, issued July 23, 1946, on an application dated March 29, 1943, to E. C. Pattee and assigned to National Distillers Products Corp., a corporation of Virginia.

Honey Treatment

PREPARATION of a sweetening medium from honey of any grade or purity is disclosed in a recent patent. If the honey is initially of high grade it may be converted into a sweetening medium by agitation with 1 to 3 percent activated carbon, for about 5 min. at 176 deg. F., followed by filtration. Honey of medium grade contains a substantial quantity of insoluble non-sugar solids, which should be removed before treatment with carbon. By heating and dilution with water, these solids will precipitate and can be filtered out. Very low-grade honey is treated chemically after dilution with water to about 40 deg. Brix. At this concentration it will have a pH of 3.8-4.0, and this is successively raised to 4.7-5.0 by addition of lime, lowered to 4.5 by phosphoric acid, and again raised to 6.7-6.9 with lime. It is then heated to the boiling point, after which the impurities are separated by any desired process. The product may then be made water-white by activated carbon, it is claimed.

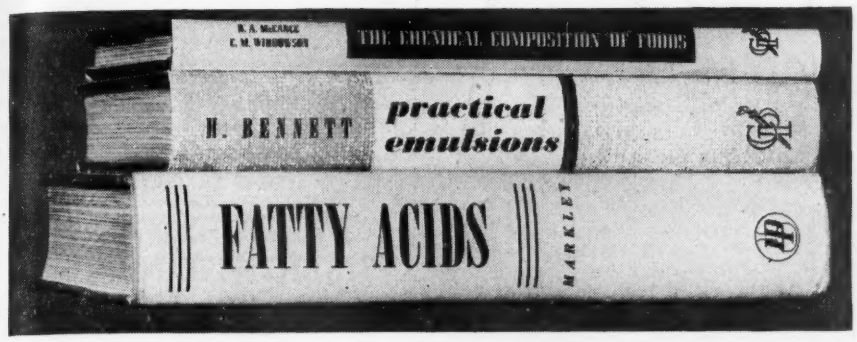
Digest from U. S. Patent 2,414,290, issued January 14, 1947, on an application dated February 12, 1942, to Arvid M. Erickson, San Jose, and John D. Ryan, Campbell, Calif., and assigned to Barron-Gray Packing Co., San Jose, Calif.

Processing Figs

BLANCHING FIGS by an improved method is the object of a recently patented invention. The figs, on an open type conveyor, pass over a body of heated water, where they are subjected to water vapor at a temperature below 212 deg. F. After this sweating process they pass under cold water sprays for cooling before further processing. It is claimed that the sap will be eliminated from the figs by the hot vapor and that the sole object of the water spray is cooling.

Digest from U. S. Patent 2,421,489, issued June 3, 1947, on an application dated July 21, 1944, to William F. Elliott, Merced, Calif.

BOOKS



Food Constituents

THE CHEMICAL COMPOSITION OF FOODS, second edition. By R. M. McCance and E. M. Widdowson. Published by Chemical Publishing Co., 26 Court St., Brooklyn 2, N. Y., 1947. 156 pages; 5½x8½ in.; cloth. Price, $3.75.

This is the second American edition of a work first published in England in 1939, but revised this year. It offers, in tabular form, the constituents of most of the foods used in England and the United States. The losses sustained in cooking are shown by analysis in both the cooked and raw states. Two sets of tables show the composition per 100 g., on the one hand, and on the other, the composition per ounce.

The constituents listed are limited to water, sugar, starch, dextrins, nitrogen, protein, fat, available carbohydrates and calories, sodium, potassium, calcium, magnesium, iron, copper, phosphorus, sulphur and chlorine. The acid-base balance, expressed in cubic centimeters of N/10 solution, is also listed.

Fats and Oils

FATTY ACIDS, THEIR CHEMISTRY AND PHYSICAL PROPERTIES. By Klare S. Markley. Published by Interscience Publishers, 215 Fourth Avenue, New York 3, N. Y., 1947. 668 pages; 6x9¼ in.; cloth. Price, $10.

Most, if not all books on fats and oils describe the more common properties and reactions of the fatty acid involved as a background to the subject under discussion. This book is devoted solely to bringing together the widely scattered knowledge of fatty acids themselves.

Facts and data on the chemical reactions and physical properties of the fatty acids are presented. The attributes of the long chain fatty acids are discussed at length, while the lower members of the fatty acid series, glyceride esters and natural fats, are given limited attention.

The author acknowledges numerous gaps in the data and regards some of the determinations as not entirely reliable. It is his hope, however, that the book will stimulate investigations that will fill these gaps. The author is principal chemist of the oil, fat and protein division, Southern Regional Research Laboratory of the USDA. The volume is the first of a new series on fats and oils.

Emulsifiers

PRACTICAL EMULSIONS, second edition. By H. Bennett. Published by Chemical Publishing Co., 26 Court St., Brooklyn 2, N. Y., 1947. 568 pages; 6x8¾ in.; cloth. Price, $8.50.

Along with bringing the material up to date, this revised edition offers additional matter on partial fatty acid esters of polyhydric alcohols and their application in bread, cake, ice cream, egg products, candy, and the like, which should hold special interest for the food chemist.

Comprehensive lists of emulsions and of emulsifying agents should be of practical value to the food processor. Chapters on Foams and Frothing and on Dispersing and Wetting Agents are among those of general interest from the standpoints of formulation, processing and sanitation.

Biological Statistics

STATISTICAL ANALYSIS IN BIOLOGY, second edition. By K. Mather. Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y., 1947. 267 pages; 6x9¼ in.; cloth. Price, $5.

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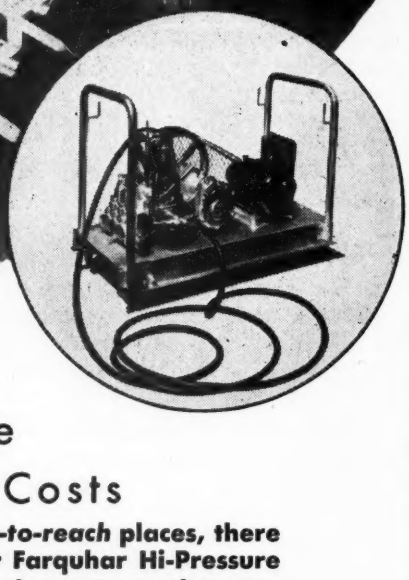

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GOVERNMENT PUBLICATIONS

The following recently issued documents are available at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the Bureau responsible for its issue.

IMPORT REQUIREMENT OF THE UNITED STATES FOOD, DRUG AND COSMETIC ACT. A guide for foreign manufacturers and shippers. Food and Drug Administration, Miscellaneous Publication No. 2. Price, 15 cents.

REPORT ON THE AGRICULTURAL EXPERIMENT STATIONS, 1946. By R. W. Trullinger and others. Price, 35 cents.

GROWTH AND CONCENTRATION IN THE FLOUR-MILLING INDUSTRY. Federal Trade Commission report dated June 2, 1947. Unnumbered.

COLLECTIVE BARGAINING WITH ASSOCIATIONS AND GROUPS OF EMPLOYERS. Department of Labor, Bureau of Labor Statistics, Bulletin 897. Price 10 cents.

WORK INJURIES IN THE UNITED STATES DURING 1945. Department of Labor, Bureau of Labor Statistics. Bulletin 889. Price 10 cents.

CORN, ITS PRODUCTS AND USES. By J. H. Shollenberger and Carol M. Jaeger. Bureau of Agricultural and Industrial Chemistry, ACE-121. Revised Feb. 1947. Mimeographed.

SOLVENT EXTRACTION OF OILSEEDS. By W. H. Goss. Bureau of Agricultural and Industrial Chemistry, AIC-135. Processed.

ANIMAL AND VEGETABLE FATS AND OILS, 1942-1946. Bureau of the Census, Facts for Industry, Series M17-7-06. Processed.

WHEAT. F. A. O. Commodity Series No. 1. March 1947. Order from Food and Agriculture Organization of the United Nations, 2000 Massachusetts Avenue N. W., Washington 6, D. C.

PATENTS

Flour Compacted Into Open Top Bag by Oppositely Directed Vibratory Pressure Before Closing Filled Bag.—Helmer Anderson, Minneapolis, Minn. to General Mills, Inc. No. 2,419,330. April 22, 1947.

Foods Quick-Frozen During Passage on Tray Conveyor Through Chamber in Which Circulates Low Temperature Air—Myron Van Etten to Salem Engineering Co., Salem, Ohio. No. 2,419,380. April 22, 1947.

Hams Boned With Little Distortion to Shape—Peter J. Staab, Stuttgart, Ark. No. 2,419,424. April 22, 1947.

Broken Egg Shells Washed, Dried, and Ground in Oxidizing Atmosphere to Give Finely Pulverized Bacteria-Free Calcium Carbonate—Mario Contesso, Astoria, Long Island, N. Y. No. 2,419,822. April 29, 1947.

Food Dehydrated by Exposure to Radiant Energy and Counter Current Flow of Heated Gas While Passing Continuously Through Six Temperature Zones—Clarence Birdseye to Dehydration, Inc., Gloucester, Mass. No. 2,419,875 and 2,419,876. April 29, 1947.

Moisture-Containing Food Products Preserved and Improved in Flavor by Reducing Original Moisture Content Substantially Preliminary to Immersing in Liquid Refrigerant Containing Flavoring Ingredient—Clarence Birdseye to Dehydration, Inc. Gloucester, Mass. No. 2,419,877. April 29, 1947.

Pectin-Containing Material Washed to Remove Water-Soluble Constituents, Leached With Acid to Remove Metallic Ions and Subsequently Washed to Remove Excessive Acid and Soluble Components to Obtain Pectates Dispersible in Cold Alkaline Solution—Edwin F. Bryant, Corona, Calif. to California Fruit Growers Exchange, Los Angeles, Calif. No. 2,419,883. April 29, 1947.

Fruit Juice Concentrate Made to Have Desired Color Quality Following Extraction and Freezing of Juices for Removal of Portion of Water Content—Harry A. Noyes, Watertown, Mass. No. 2,419,909. April 29, 1947.

Liquids Containing Suspended Solids and Calcium Ions Clarified by Addition of Alkali Metal Pectate or Ammonium Pectate and Subsequently Separating Flocculated Solids From Liquid—C. W. Wilson, Norco, Calif., to California Fruit Growers Exchange, Los Angeles, Calif. No. 2,419,930. April 29, 1947.

Buns Made From Elongated Roll of Dough by Mechanical Means—William C. Grimm and Richard H. Linneman, Jersey City, N. J. to General Baking Co., New York, N. Y. Reissue No. 22,875. May 6, 1947.

Hard Crabs Placed in Superimposed Layers Alternately With Dry Seasoning Mixture in Wheeled Truck and Subjected to Steam Pressure to Give 195 Deg. F. for Predetermined Period to Obtain Desired Degree of Cooking and Seasoning—Daniel Barrett, Appeal, Md. No. 2,420,063. May 6, 1947.

Eggs Mechanically Cleaned by Sand Blasting—Roy E. Hutchins, Jr., Raymond, N. H. No. 2,419,933. May 6, 1947.

Natural Sugar Mash Fermented With Mixed Culture of Molasses and Grain Yeasts to Make Ethyl Alcohol—David A. Legg, Philadelphia, Pa. to Publicker Industries, Inc., No. 2,419,960. May 6, 1947.

Lactic Acid Recovered From Acidified Fermentation Liquors — Edward M. Filachione, Philadelphia, and Charles H. Fisher, Abington, Pa. to United States of America. No. 2,420,234. May 6, 1947.

Fats Stabilized Against Oxidization by Small Quantity of Vitamin B Complex and Mono-ether of Hydroquinone—Paul Gyorgy, Cleveland, Ohio to Wyeth, Inc. Philadelphia, Pa. No. 2,420,238. May 6, 1947.

Alkaline Earth Metal Lactate Treated With Acetic Acid to Form Addition Compound—Ritchie Hart Lock, Chigwell, England to Howards & Sons, Ltd., Ilford, England. No. 2,420,255. May 6, 1947.

Packaging Perishable Foods in Form-Fitting Tubular Casing of Stabilized Rubber Hydrochloride—Leo A. Goodman, one-half to Marcleph & Co., Inc., Brooklyn, N. Y. No. 2,420,310. May 13, 1947.

Peeled White Potatoes Protected Against Discoloration by Treating With Cool Solution of SO_2 of From 0.5 to 6.0 Percent Concentration and Storing in Closed Container Under Refrigeration Above Freezing—Ralph F. Matarazzo, Medford, Mass. No. 2,420,322. May 13, 1947.

Foods Dehydrated by Use of Hydrophilic Liquids—John D. Brandner, Wilmington, and Rudolph Max Goepp, Jr. New Castle, Del. to Atlas Powder Co., Wilmington, Del. No. 2,420,517. May 13, 1947.

Meat Tenderized by Mechanical Stretching to Destroy Continuity of Connective Tissue and by Surface Treating to Close Openings and Inhibit Loss of Natural Juices—Harry H. McKee, Nicholas J. Dziedzic and Charles L. Straeten, Chicago, Ill. to Industrial Patents Corp. No. 2,420,549. May 13, 1947.

Concentrated Coffee Extract Obtained by Two-Stage Hot Water Extraction of Ground Roasted Coffee Followed by Evaporation and Addition of Cold Distillate Extract From Prior Batch of Ground Roasted Coffee—Edwin Palmer and David S. Schwartz, Brighton, Mass.

(*Patents continued on page* 196)

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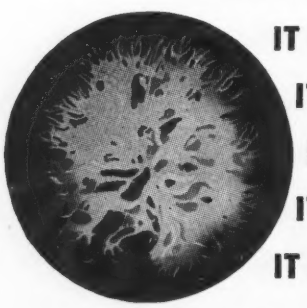

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PATENTS

(*Continued from page* 195)

to Harry Sachs and Edwin Palmer, Baltimore, Md. copartners trading as Moorehead Manufacturing Co. No 2,420,615. May 13, 1947.

Malt Sprouts Prepared for Use in Bakeries by Grinding, Extracting With Ether and Drying Sprout Residue—Roland W. Selman, Jr., Kansas City, Kans. and Homer S. Myers, Kansas City, Mo. to Campbell-Taggart Research Corp., Kansas City, Mo. No 2,420,567. May 13, 1947.

Peaches and Other Drupes Mechanically Held and Rotated Through Predetermined Angles of Inclination to Horizontal During Splitting, Pitting and Peeling—Raymond L. Ewald and Henry A. Skog, Olympia, Wash., to Special Equipment Co., Portland, Ore. No. 2,420,659. May 20, 1947.

Peel Oil Expressed From Whole Citrus Fruits by Uniformly Applied Pressure—Wilbur A. Pipkin, Safety Harbor, Fla. No. 2,420,678. May 20, 1947.

Juice and Peel Oil Selectively Expressed From Whole Citrus Fruits by Mechanical Pressure—Wilbur A. Pipkin, Safety Harbor, Fla. Nos. 2,420,679 and 2,420,680. May 20, 1947.

Juice Expressed From Whole Citrus Fruits by Mechanical Pressure and Without Peel Oil Contamination—Robert E. Peterson, Los Angeles, Calif., to Food Machinery Corp., San Jose, Calif. No. 2,420,681. May 20, 1947.

Water Mechanically Removed From Water and Oil Emulsion During Passage Through Electrified Field—Arthur D. Small, United States Army, Washington, D. C. No. 2,420,687. May 20, 1947.

Water Absorptive Properties of Protein Reduced by Treatment With Mixture of Nitrous Acid and Highly Ionized Strong Mineral Acid Such as Hydrochloric—John Robert Coffman, St. Paul, Minn., and Harry F. Lewis, Appleton, Wis., to General Mills, Inc. No. 2,420,735. May 20, 1947.

Water Absorptive Powers of Protein Reduced by Converting Their Ammonium Groups and Primary Amide Groups to Carboxyl Groups Containing Furfuryl Group—John Robert Coffman, St. Paul, and Harry F. Lewis, Appleton, Wis., to General Mills, Inc. No. 2,420,736. May 20, 1947.

Nonrigid Pectin Sugar Jelly Made by Adjusting Pectin-Containing Jelly Batch to pH Range of 4.0 to 7.0 and Heating at 180 to 220 Deg. F. for From 5 to 30 Min.—Donald R. Thompson, Ontario, Calif., to California Fruit Growers Exchange, Los Angeles, Calif. No. 2,421,093. May 27, 1947.

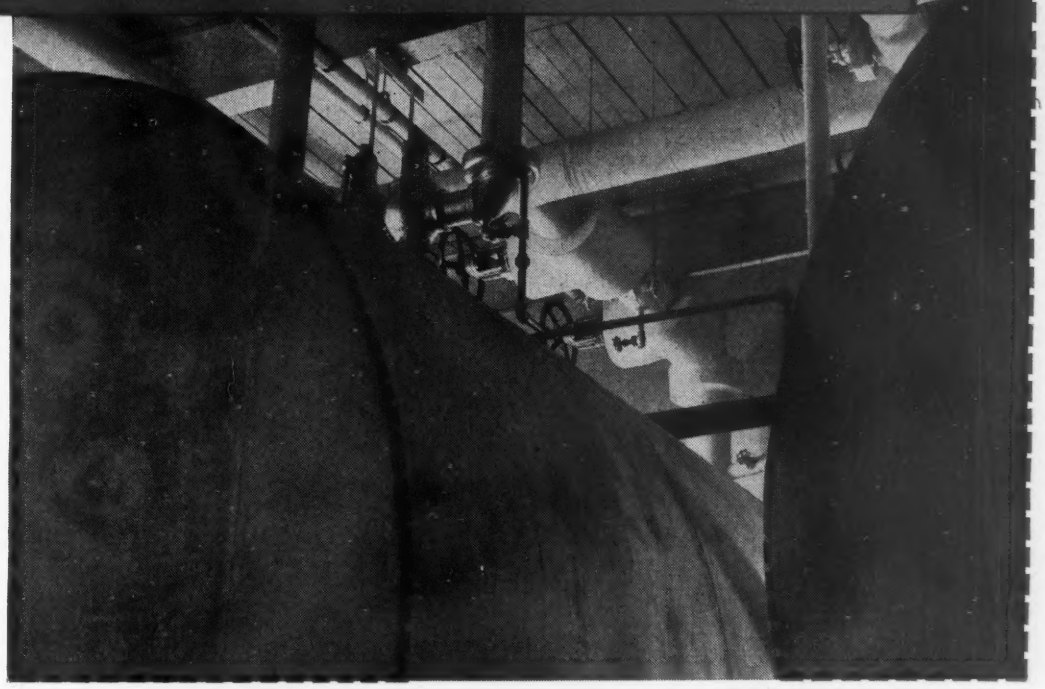
Calcium Pectate Dissolved in Latex to Form Thixotropic Gel—Clarence Walter Wilson, Norco, Calif., to California Fruit Growers Exchange, Los Angeles, Calif. No. 2,421,107. May 27, 1947.

Pectin Sol and Alkaline Earth Compound With Water Solubility Equal to Calcium Sulfate Added to Alkaline Latex to Form Thixotropic Gel—Clarence Walter Wilson, Norco, Calif., to California Fruit Growers Exchange, Los Angeles, Calif. No. 2,421,108. May 27, 1947.

Antioxidant, Nordihydroguaiaretic Acid, Obtained by Solvent Extraction of Larrea divaricata—Joseph Adams, Chicago, Ill., to University of Minnesota, Minneapolis, Minn. No. 2,421,109. May 27, 1947.

Ethers of Lactic Acid Esters Synthesized by Heating Pyruvic Aldehyde Di-Acetal Above 100 Deg. C. in Presence of Acid Catalyst and Alcohol—Howard R. Guest, Charleston, W. Va.; Louis C. MacDowell, Lakeland, Fla.; and Raymond W. McNamee, South Charleston, W. Va., to Carbide and Carbon Chemicals Corp., New York, N. Y. No. 2,421,378. June 3, 1947.

How would YOU finish the ends of these insulated boilers?



These Scotch marine-type boilers are insulated with 85% Magnesia block 3" thick, finished with a pasted 8-oz. canvas jacket. But the boiler ends, shown here, have reinforcing ribs projecting 2½" out from the casing. What's the best way to finish these ends?

☐ Canvas, same as rest of boiler?

☐ Extra insulation over ribs, covered with canvas?

☐ Asbestos cloth instead of canvas?

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With heat-transmitting metal ribs only ½" away, a canvas cover would quickly scorch and possibly burn. This makes the first solution impractical. The second plan is better, but it has three drawbacks: it would require a good deal of extra insulation, the heat saved would be trifling, and installing the finish over the closely spaced ribs on the boiler ends would be a time-consuming, costly job.

The most advantageous method is the third, shown in the photograph. The slight extra cost of asbestos cloth is justified because it is lasting and fireproof. Its slightly rougher appearance is inconspicuous at the rear of the boilers.

In itself, this problem is hardly of major importance. It doesn't affect the over-all efficiency of the insulation or involve much money. But it does illustrate the way Armstrong's engineers tackle a job.

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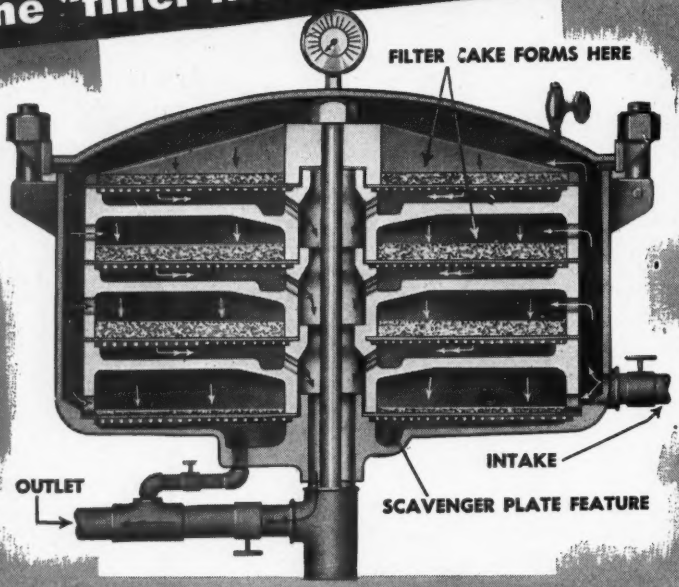

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★ Equally effective whether removing carbons and contact clays or clarifying and polishing with filter aids.

★ Patented Scavenger Plate permits *complete* batch filtration. (It's virtually an auxilliary filter with an independent control valve.)

★ Unexcelled filter cake stability — no slipping or breaking.

. . . why?

Because filter media are supported on a horizontal plane and filter aids floated into position uniformly; filtration takes place uniformly over entire filtering areas. Flow through filter is always *with* gravity.

Sparkler Filtration Is *Engineered* Filtration—we invite correspondence on your problem. You will receive the advice of filtration scientists with a quarter of a century of experience in a specific field.

SPARKLER MANUFACTURING COMPANY
MUNDELEIN, ILLINOIS

Grievances Cut

(*Continued from page* 91)

plaints and questions to him depended on the relationship existing between the two of them. The foremen agreed that they would make every effort to become better acquainted with each individual employee, and that they would discuss his progress on the job at least twice a year.

3. In order to supplement this agreement we designed a new rating form intended to help the foremen in more specifically discussing the employee's performance. Everyday job factors and shop rules were carefully considered in developing the form. For example, such matters as horseplay and absenteeism were given a place in both ratings and shop rules. We argued that the foremen could minimize many possible violation causes in their merit discussions making it unnecessary to mete out penalties for infraction of rules at a later date.

4. Finally, we arranged to hold group meetings with our union bargaining committee. Our intent was to reduce misunderstandings by advising the committee of changes or to provide other new information. This proved to be an excellent channel through which we could resolve problems and complaints that hadn't yet developed. Up to this point we haven't held one of these informational meetings without uncovering some little matter bothering an individual or the bargaining committee.

The results obtained in the last six months of the year convinced us that we had followed a practical plan. The very nature of the revised procedures helped to establish a better understanding between the foremen and stewards. Certainly, the great majority of their contacts were on far less antagonistic grounds

Most of the people at the operating level became convinced that we were making an honest effort to solve our differences on a just and equitable basis. Our efforts convinced them that we were not in business to antagonize unions or to shove people around. Rather, we recognized our employees to be very important assets and we wanted to work with them toward our mutual goal of getting out production on the most efficient possible basis.

In addition to solving our particular problem, we learned through practical experience that these methods of working with our peo-

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housewives, sells faster, when
it is packed in familiar
Foster-Forbes glassware.

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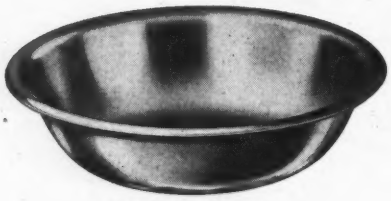
2½ QT. PAN

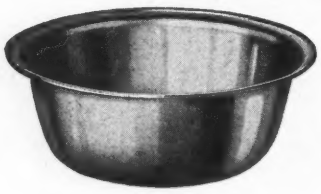
2 OZ. MEASURING CUP

COVERED 9 OZ. JAR



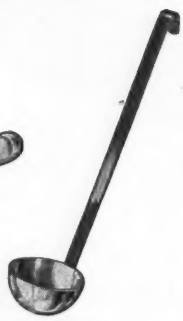
5 QT. BASIN

4 QT. PITCHER



9 QT. BOWL

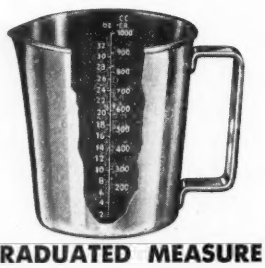
CAKE TURNER



LADLE

SOLID SPOON

PERFORATED SPOON



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ple took us a long way toward the development of mutual trust and confidence. We, who are close to the problem, recognize this as the major hope of bringing about real industrial peace.

It is obvious that these practices must be continuous. As long as people work together there will be irritations, misunderstandings, and mistakes. There is no known employee relations technic that will eliminate human frailties, but many causes of irritations can be eliminated, misunderstandings can be reduced and mistakes can be rectified. This is our job and it must be done well if management is to be provided with its proper share of time for successfully guiding the business. The employee's stake in the process lies in fuller assurance of continued employment and a more satisfying and happy work experience.

—End—

Moisture Determination

(*Continued from page* 110)

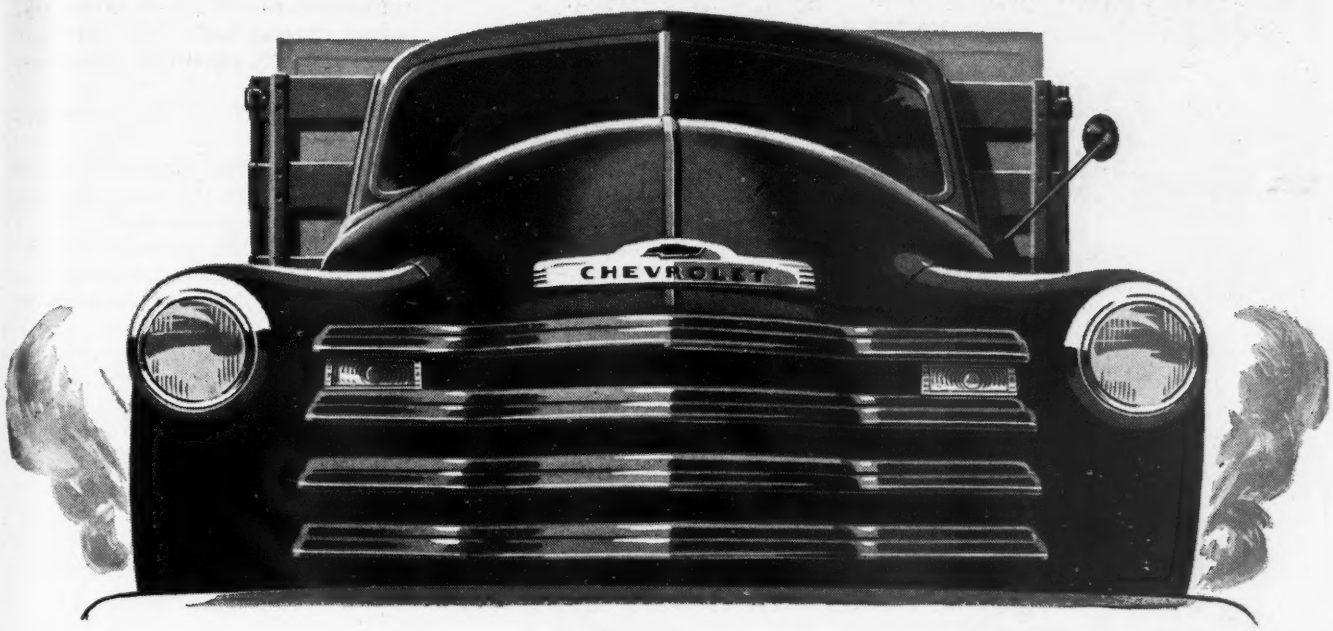
g. in weight. Theoretical weight losses for cheeses of different moisture contents are given in Table I.

To check the accuracy of this calcium carbide method, prepared samples of grated cheese were used in which we deliberately placed moisture contents ranging from approximately 10 to 25 percent. These samples, after treatment, were weighed on the analytical balance and on a Cenco trip scale. The results were compared with those given by the standard vacuum oven drying and Bidwell Sterling toluene distillation methods. See Table II.

Technical grade, pebble size calcium carbide, which was purchased at a local hardware store, was originally used. We found that with coarse grinding with mortar and pestle, a ten minute reaction time on the boiling water bath was necessary. A reaction time reduction to five minutes was secured by pulverizing the calcium carbide. At present we weigh and package 5.0 g. portions of the pulverized carbide, which can then be added to the sample of cheese in the beaker. By packaging the portions in advance we secure even greater simplicity of the analysis.

Cheese contains moisture in both free and combined form. If the reaction is carried out at room temperature, only the free water reacts with the carbide. In our experiments we found that it was impossible to develop a factor to com-

All over the nation—THEY'RE GOING PLACES!



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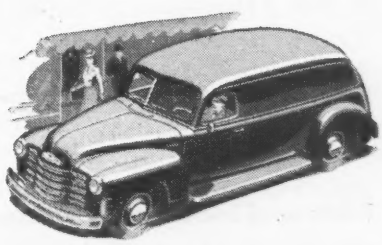
Going places? Yes, sir! And doing things in a big way to increase profits for owners. They're new *and they're different!* They're ADVANCE-DESIGN trucks with the unique cab that "breathes"—that almost literally "inhales" fresh air and "exhales" used air!* Make it a *must* to see them. Take a moment to meet THE TRUCK WITH THE CAB THAT "BREATHES"!

THE CAB THAT "BREATHES"—fresh air is *drawn in* from the outside—heated in cold weather—and used air is *forced out!*

The cab is **FLEXI-MOUNTED**—cushioned on rubber against road shocks, torsion and vibration! . . . **DRIVER'S COMPARTMENT** is wider, with more leg room. The seats are fully adjustable, bigger and more comfortable. Wider, deeper **WINDSHIELD** and **WINDOWS** increase visibility by 22%!



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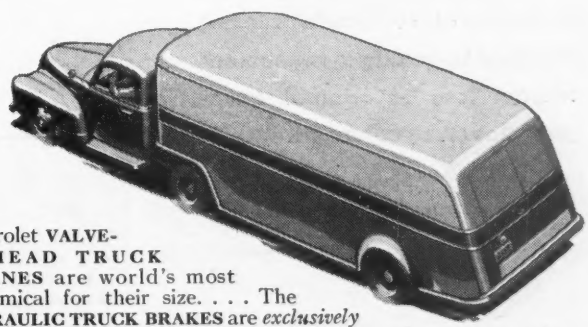

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pensate for the non-reacting combined water, possibly because our different types of domestic and imported cheeses have quite different physical and chemical characteristics.

Conclusions from this investigation are that:

1. This method has met all of our objectives in the determination of moisture in grated cheese.
2. This method probably can be applied to other granulated or powdered foods where a tolerance of ± 1 percent is satisfactory.
3. The method offers the possibility of being an ideal moisture test for continuous moisture control.

References

1. Triebold, "Quantitative Analysis, Agricultural and Food Products." D. Van Nostrand & Co., Inc., 1946.
2. McNeil, U. S. Dept. Agriculture Circ. 97, 1912.
3. Blish and Hites, *Cereal Chemistry*, 7, 99, 1930.

—*End*—

Baby Food

(*Continued from page* 109)

during the war years. And working mothers naturally use more processed foods for the baby.

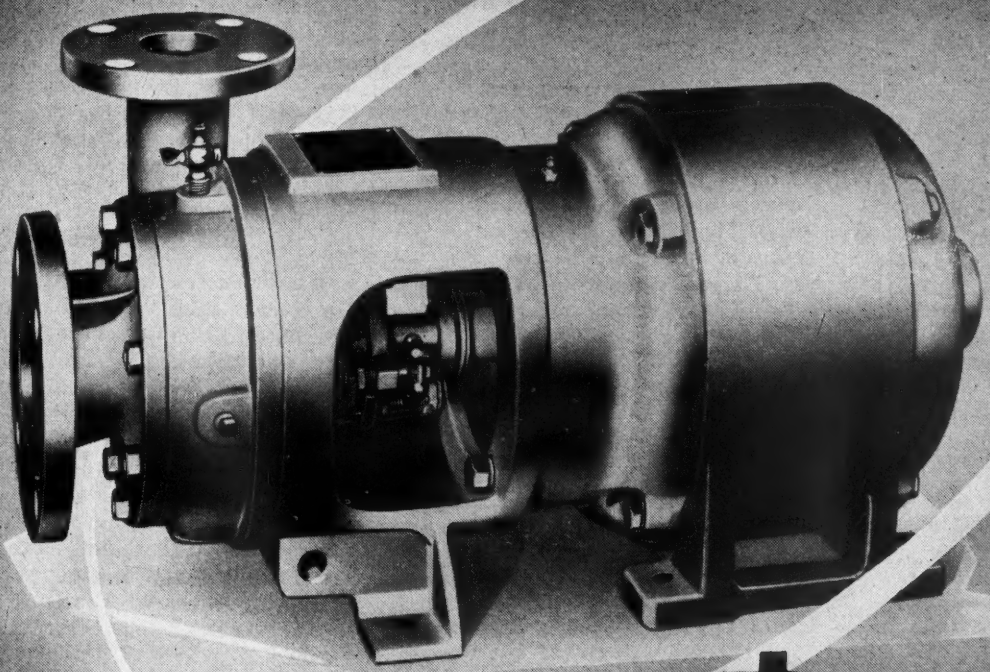
Most important, look at what's happening to the birth rate. The baby in the household is still the major consumer of canned baby foods. So the birth rate shows what the size of the potential market will be.

In 1945, the birth rate was 19.6 per thousand population, and in 1946 it reached a high of 23.3 per thousand population. Estimates for 1947 indicate that it will remain at the same level as in 1946. But then it will start to fall.

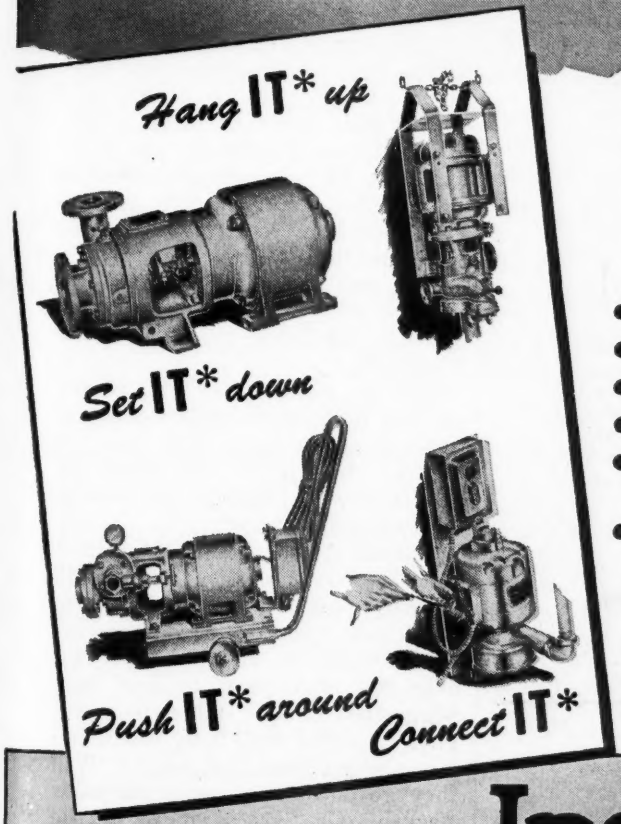
The rise in birth rates helped continually to widen the market. That boom has about played itself out. Now that fewer babies are expected in coming years, the thing to look for would be a shrinkage of the canned baby foods market.

However, all of these are immediate factors. On a long-term basis, intensive marketing and advertising jobs might increase the market. The market today has reached only a 13 percent saturation (see calculation elsewhere in this article). That means that 1946 sales were only 13 percent of all the baby food that all babies could consume of such foods. Naturally, 100 percent saturation of the market for anything is impossible—even for bread, the staff of life. It's not a matter of what people might use, but more

THE *Versatile* PUMP...



MOTORPUMP*



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1927 — 20TH YEAR OF GETTING THERE FIRST! — 1947

important, of what they can afford.

However, there's no law that a 13 percent saturation in the canned baby foods market has to be the maximum, either. Maybe advertising can convince more mothers of the advantages in using canned baby foods. Or, on the other hand, maybe margins can be squeezed to lower prices and thus to wedge open markets. Obviously, there are lots of possible technics—and industry men know the score on them best of anyone.

Shift in the Pack

Whatever the immediate causes, the fact remains that demand is leveling off. Some packers are tackling this problem by reducing the production of extreme luxury items. They are packing less desserts and fewer of the fancier types: 1946 dessert production was down by one-half from 1945. That's because gelatins and puddings which the family used to eat and share with baby are back on the market.

Some packers are cutting down on vegetables, too. Output was slashed 18 percent last year. Many of these vegetables are fairly simple to prepare at home, hence are among the first to go when money gets tight.

At the same time, however, more canned fruits and canned meat compounds were made in 1946 than in 1945—twice as much canned meat compounds in 1946 as in 1945, and almost half again as much fruits.

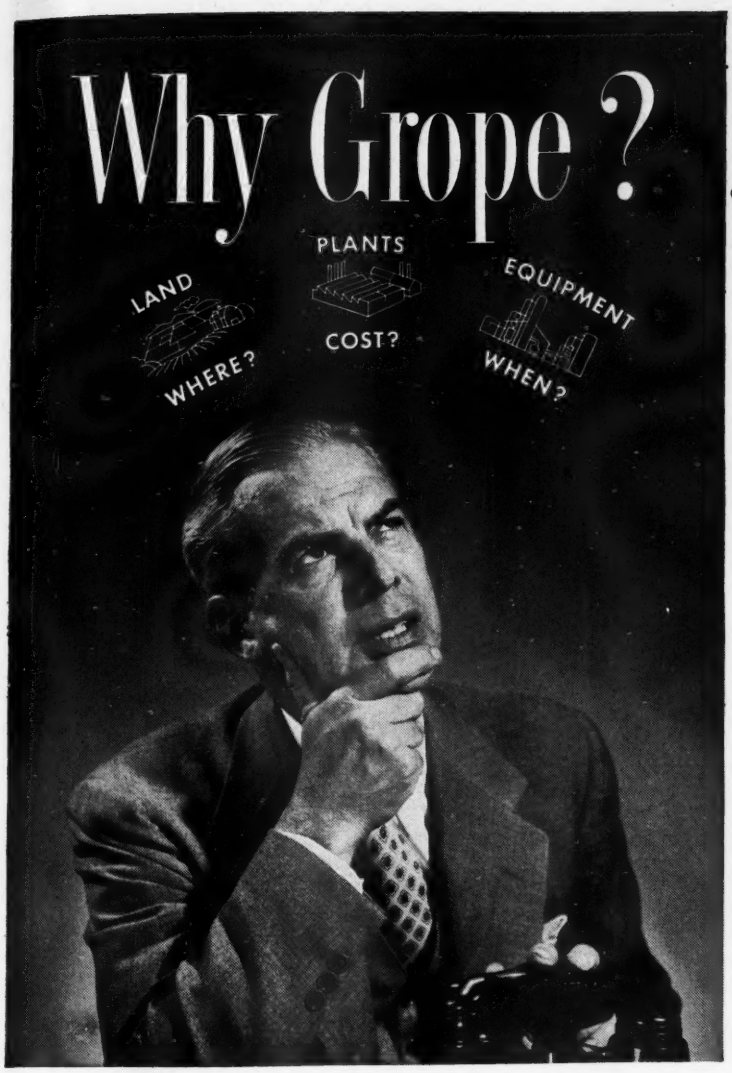
Right now, processors are packing less of everything than last year. First-quarter 1947 production of all baby foods was one-third less than in 1946.

One reason for the reduced production may be that packers are waiting for lower prices of basic foodstuffs.

But the consumption side of the picture is not that bleak. Sales are holding up to early 1946 physical volume (they are up in dollars, of course); with output off, inventories are going down.

For the future, the main question concerns consumption. What will happen to baby food sales if the total dollars spent by consumers for food shrink by 10 to 15 percent over the next year, as has been suggested (Food Industries, August, p. 112)? Will baby foods dollars also go down that much? Will they go down more as birth rates slacken? Or less, as more of the potential market is "sold"?

The answer rests in good part with the industry. It cannot count on uninterrupted growth in mar-



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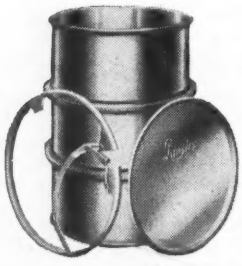

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kets. It has to try for the first time in its history to readjust to a new economic environment. Costs, promotion, and distribution all come in now for new scrutiny.

Data used in this article are the latest available from the Department of Commerce, which has discontinued the compilation of statistics on baby foods. It is understood that the National Canners Association may continue these records.—The Editors.

—End—

Freezers Evaluated

(*Continued from page* 97)

of preparing, freezing and storing a frozen product is represented by the cost of the freezing operation itself. On a per pound basis, excluding raw material costs, this factor will represent less than 10 percent of this cost. Yet, every cost item is important.

The actual operating cost of a particular freezer depends almost entirely on one condition—the operating temperatures required by the system. The lower the required temperatures, the higher the costs. Other factors are involved, including the number and size of machines such as pumps, fans and conveyors. All of these other items lumped together, however, represent only a small part of the total operating costs. Compressors require the power. Consequently, it is the size and number of compressors which determine power costs.

Space Requirements

Floor squace requirements of a particular freezing system influence the amount of building space required for the freezing operation. This in turn affects directly the pocketbook of the producer, both in initial building costs and maintenance. Thus, it is a limiting factor which confronts the engineer in designing or selecting the freezing system most suitable for a particular operation.

One of the great advantages of a quick-freezing process is the smaller floor space required for faster freezing systems. In this respect, the greater rate of heat transfer of an immersion freezing system is an advantage over the slower rate which is inherent in an air-freeze system.

Comparison of Various Systems

Data in Table II are obtained by using the eight performance factors together with a simple (and

a healthier generation

A new generation of Americans is growing to maturity—healthy, husky, and alert! They are the children of the new enrichment age, wherein full, balanced nutrition is an important consideration.

Bread, always the staff of life, is the keystone of this new emphasis on improved nutrition. The American housewife has learned to read labels and wrappers carefully for assurance that her family's food will provide the vitamins, minerals, and calories necessary to buoyant health. Now, as never before, bread—*enriched bread*—is the preferred family food.

As the foremost manufacturer of pure vitamins and minerals, Merck has served as a central and dependable source of enrichment ingredients. Backed by thorough experience, extensive resources, and rapidly expanding production facilities, we will continue to serve the baking field and other branches of the food industry eager to incorporate decisive nutritional advantages into their products.

MERCK ENRICHMENT PRODUCTS

Merck provides an outstanding service for the milling, baking, cereal, and macaroni industries.

Merck Enrichment Ingredients

Merck Vitamin Mixtures for Flour Enrichment

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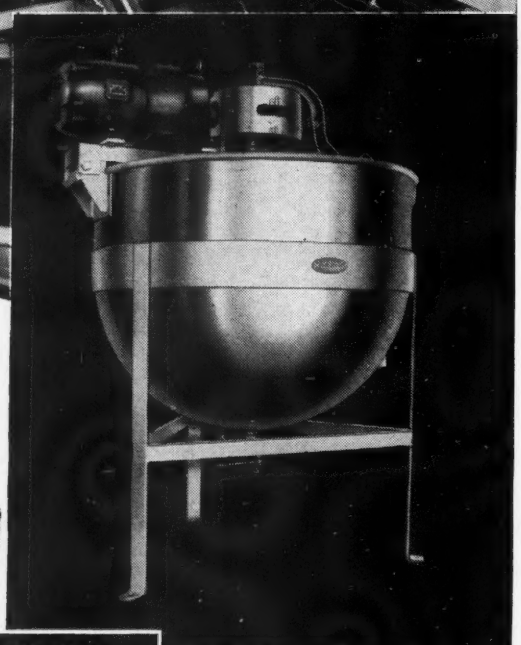
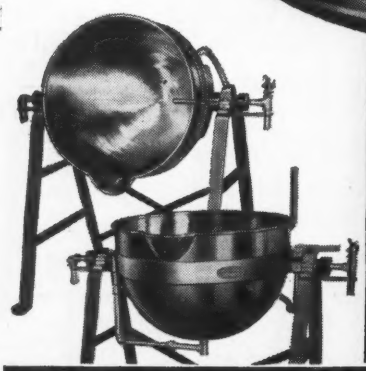
There's nothing complicated or mysterious about the construction or value of Hamilton kettles, but at every point they show knowledge of food men's needs and the skills that alone can produce such good equipment. No finer kettles are made—none are a better investment. No other kettle will stand up longer for less per day.

LOOK INTO MIX-COOKING

THE HEART OF FOOD PROCESSING





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THE KETTLE WITH THE **HAMILTON** NAME

admittedly inexact) A, B and C comparison scale.

Obviously, these ratings are based largely on the experience and studies of the authors, and since many of the readers have had different experiences and backgrounds, they are bound to disagree with some of the data. Criticisms of this chart are expected and will be welcomed. Careful consideration will be given to all such written criticisms and suggestions as a means of improving the usefulness of the chart.

It may be concluded that there will be:

1. A great opportunity to provide packers with food freezing systems which will reduce labor, power and package costs.
2. A revival in the use of the Birdseye or other pressure plate systems for small plants. Some development reminiscent of the early Birdseye belt continuous freezer may be expected because of its potentially lower materials handling costs.
3. An increased usage of liquid immersion freezing systems.
4. A greater trend to the use of "staged" or "booster" compressors.

—End—

It's The Law

(*Continued from page* 102)

In view of this testimony the higher court held the creamery company, instead of the municipality, liable in damages, and said:

"Under such circumstances it was the duty of the company to take care that these products did not escape or that they were so treated that when they left its property they had lost their capacity to do damage. The fact that before reaching the farm of plaintiff (Klassen) these harmful waste products flowed through the sewer system of the city does not excuse the defendant (creamery), which created them, and permitted them to escape."

Also, see *Berry v. Shell Petroleum Co.*, 140 Kan. 94, where a company had emptied salt water into the sewer of a city. While flowing through part of this sewer system some of this salt water seeped into the soil and finally damaged the water supply of the owner of private property who sued to recover damages.

The higher court held the company and not the city liable for damages resulting from pollution of the water.

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The No. 4-96 mixture is designed for fruit low in acidity or which is to be packed in heavy syrup.

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Draver Vegetable Feeders offer an ideal means of providing a controlled flow of beans, peas, diced carrots or potatoes, cut corn, and similar sized vegetables, to or from picking tables, cookers, freezers, or other processing equipment.

Draver Vegetable Feeders are available in 3 standard models, with 3 capacity ranges to each model. Capacity ranges between 2 to 350 bu. per hr. All models are completely galvanized and can be furnished for belt or chain drive or direct motor driven. Each Feeder is a complete self-contained unit, ready to install and operate.

Model No. 544 Draver Vegetable Feeder complete with Style "A" galvanized hopper. No. 544 can be furnished for capacities of 5 to 75, 25 to 250, or 30 to 350 bu. per hr.

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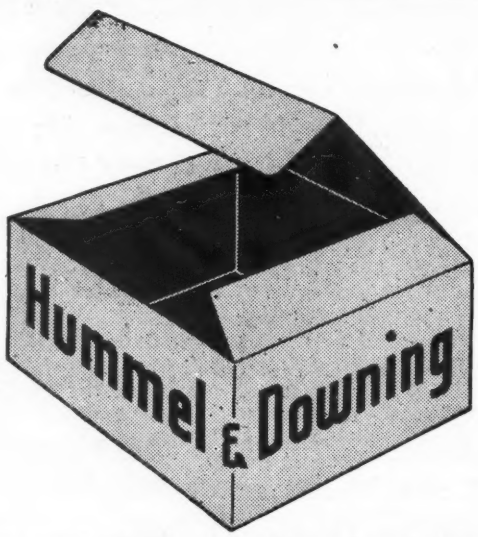

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cent higher court, if a wholesaler or distributor of food sells packages falsely labeled and the retailer innocently resells the falsely labeled, the latter is responsible.

See *Bureau of Weights & Measures v. Hey & Co.*, 42 Atl. (2d) 821, where the testimony shows that a distributor of butter buys from western creameries, which packs the butter in cartons and resells it. An inspector for the Bureau of Weights and Measures examined several packages of butter found at a retailer's store. These packages were wrapped in waxed paper and marked with the printed statement: "One pound net weight butter." Each package was found to weigh only 15 ounces net.

A suit was filed against the distributor and packer by authorities on the charge that he had violated a state law, which specifies a heavy penalty for any person or firm that sells any food commodity "on the container of which is marked any false statement respecting that . . . quantity, weight, or measure of such commodity, or of any part thereof."

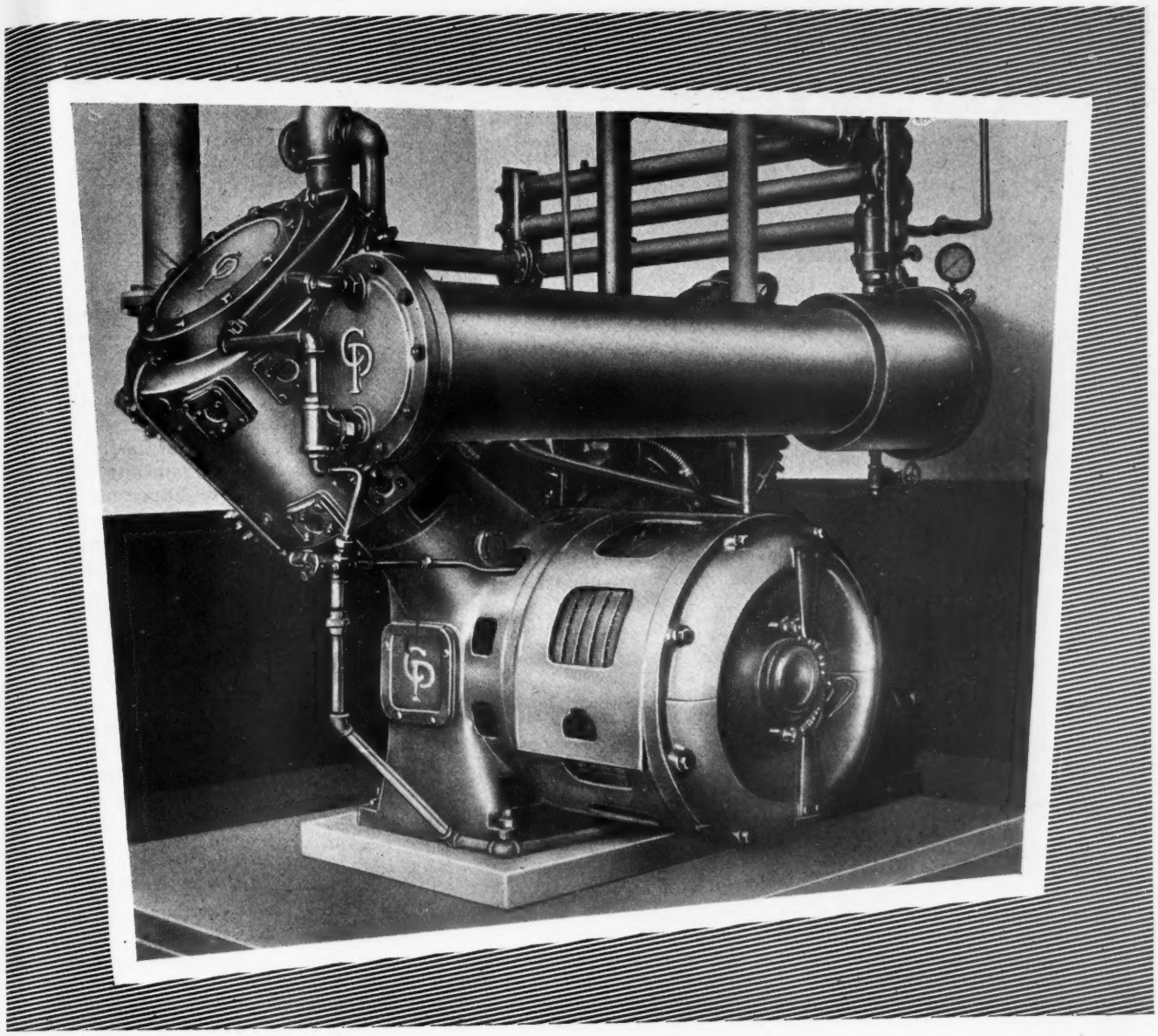
The lower court convicted the distributor but the higher court reversed the verdict and set aside the penalty. This higher court held that retailers are guilty of violating the law who sell packages labeled incorrectly as to weight of the food therein. This court also said that it is the duty of all retailers to reweigh packages of food and *know* that such packages contain the weight indicated on the label.

"House" Trade-Mark—In *J. S. Ivins' Son, Inc., v. United Biscuit Co.*, 158 Fed. (2d) 397, the Court of Customs and Patent Appeals refused to register a trade-mark on baking goods "Gate House Cookies by Ivins" in view of a prior trademake "Town House" upon cookies, crackers, and other baked articles and food products.

Also, see *J. S. Ivins' Son, Inc., v. Lamont, Corliss & Co.*, 158 Fed. (2d) 399. Here the court refused to allow registration of a trademark "Gate House Cookies by Ivins" accompanied by picture of a gate and house at the side, because of confusing similarity to a registered trade-mark "Toll House" for chocolate and cookies.

Implied Warranty—According to a recent higher court, retail dealers warrant the purity of food they sell.

For example, in *Martin v. Great Co.*, 192 S. W. (2d) 201, the higher court held that under the Uniform Sales Act retail dealers impliedly guarantee that food is suitable for human consumption, notwithstand-



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TYPE Y COMPRESSOR

Shipped intact as a "package unit," ready for external connections, a CP Type Y Compressor can be set up quickly with minimum expense. It needs only a simple foundation, and requires no special skill to align and install it. Its compact design renders it ideal where floor space is restricted.

It operates at high efficiency with low maintenance because of such features as large area Simplate valves . . . multi-step capacity regulation . . . effective inter-cooling . . . precision bearings . . . force-feed lubrication.

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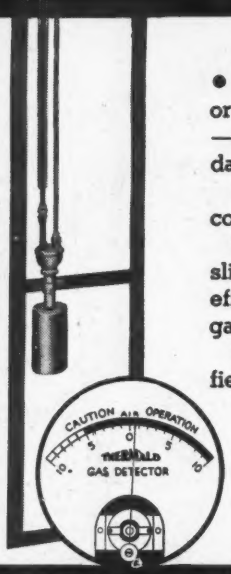

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UNITED STATES STEEL

ing the retailer had no opportunity to inspect the food since it was encased in sealed packages by the manufacturer.

This court held the retail dealer liable for sickness caused a consumer who ate from a can of impure "chili con carne."

—End—

More Wheat

(*Continued from page* 71)

mile square block of land north of Hartman, Colo., will be drilled to wheat for a 1948 harvest—64,000 acres of new wheat field.

Newcomers from the East and Texas make up 80 percent of these new farmers, but they are not alone in plowing up the range land. Others are men who settled in the territory as early as 1904. One man who had operated a 13,000 acre cattle ranch has plowed up 3,000 acres for wheat. He is one of the three backers of a new 100,000 bu. grain elevator being built to handle the grain raised on this former grazing land. One of his partners in the elevator project planted 118,000 acres of wheat last fall and thinks that he will plant about 200,000 this fall.

Destructive Aspect

Though the expansion in wheat planting may seem in order when both the domestic and export demands are so heavy, the situation has a definite destructive aspect. The same type of increased production in other grazing land areas has taken place before, prior to the outbreak of World War I in Europe and again following the war in 1918-21. Price of wheat was high, land values low, and the rainfall was on the wet side of the cycle, all of which insured good crops. When the dry side of the cycle returned, however, there was no deeply rooted cover vegetation to prevent the top soil from blowing.

The expansion period before World War I had no immediate destructive aftermath. Plowing was done with mold-board plows and was deep enough not to powder the top soil. Also, a consistent demand for wheat and grain crops kept the land in use throughout the war years. Then came the wildcat expansion, aided by disk plows, which followed World War I. Disk plows do a thorough job of powdering the top soil and making it susceptible to blowing when there is insufficient rainfall to keep it wet. The dry

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PRODUCT CONTAMINATION

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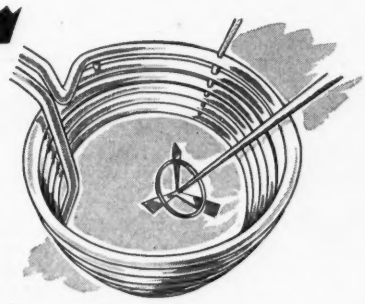

Before specifying tubing for new equipment that comes in contact with delicate, easily contaminated food products, consider the many cost-saving advantages of ELECTRUNITE Tubing—made of Republic ENDURO Stainless Steel.

For more than 25 years, ENDURO Stainless Steel has proved itself inherently clean, sanitary and easy to keep clean. It resists corrosion . . . does not contaminate metallically . . . is strong and long lasting because it is *solid* stainless steel throughout.

Add the fabricating economies of all tubing made by the ELECTRUNITE Process of electric resistance welding—*uniform wall thickness, diameter and concentricity*—and you will see why it pays *always* to specify ELECTRUNITE Stainless Steel Tubing.

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cycle hit the area just when previous bumper crops caused a neglect of this disk-plowed ground, and erosion resulted in the destructive dust storms of 1933 and 1934.

Conservation Efforts

The same condition will probably arise again when the European, Asiatic and northern African grainlands start producing—easing the present shortage—and when the newly plowed areas move into the dry side of the rainfall cycle. People interested in soil conservation are joining conservative ranchers and bankers in efforts to discourage the breaking up of the sod. But in the face of plenty of rainfall and government-supported high prices for wheat, the conservationists are receiving little attention. The owners of the land feel it is their prerogative to do as they wish with it—to make their killing now and, undoubtedly, to cash in later on government money for soil erosion control when rain is scarce and wheat prices unprofitable. These migratory speculator wheat growers will become equivalent to the "Okies", and the "Old Timers" will try to rehabilitate their grazing prairies by replanting with buffalo grass—as was done in the middle 1930's—if sufficient seed is available.

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